Engineering

Volume

208

July–December 1969

Issue	Serial number	Pages
4 July	5384	1–24
11 July	5385	25–48
18 July	5386	49–74
25 July	5387	75–100
1 August	5388	101–124
8 August	5389	125–150
15 August	5390	151–176
22 August	5391	177–202
29 August	5392	203–226
5 September	5393	227–280
12 September	5394	281–304
19 September	5395	305–328
26 September	5396	329–352
3 October	5397	353–378
10 October	5398	379–404
17 October	5399	405–430
24 October	5400	431–456
31 October	5401	457–482
7 November	5402	483–508
14 November	5403	509–532
21 November	5404	533–558
28 November	5405	559–582
5 December	5406	583–608
12 December	5407	609–634
19/26 December	5408	635–672

Engineering founded 1866
Published every Friday by
Engineering Ltd 36 Bedford Street
London WC2 United Kingdom*
telephone 01-240 0641
01-836 3663
telex 261828
telegrams and cables
Engineering London Telex

President
J A Dixon MA CEng

Chairman
G H Dixon MA

Financial Director
J D E Dixon ACA

Editor and Joint Managing Director
F B Roberts MBE CEng

Deputy Editor
D Fisher PhD BSc(Eng) CEng

Assistant Editors
A A H Scott BSc(Eng) CEng
C R H Simpson
J R Day BSc
E J Jeffs BSc(Eng) ACGI
L R Livesey
G D Edwards BSc(Eng)

Art Editor
R L Burns

Information Officer
Barbara Goreham

Circulation Manager
K F Bosworth

Advertisement Manager and Joint Managing Director
G A Roberts

Classified Advertisement Manager
T G Baber

* Since the completion of this Volume 208, *Engineering* has been published by Engineering, Chemical and Marine Press Ltd on behalf of IPC Business Press Ltd

© Engineering Limited 1970

Index

A

Abbott, P. J., locomotive design 215
Aberthaw B power station, plant failures 616
Abrahamson, M. W., engineering law and ICE contracts (book) 222
Abrasive wear, Engineering Outline 479
Abu Dhabi, gas-turbine plants 495
Accident(s), aircraft, Boeing 707 airliner 155
emergency tests 585
possible extent of 483
and disasters, planning for 483
motorcycle 28
railway, derailment at Darlington 331
London Transport, Neasden 637
Quintinshill collision, by J. A. B. Hamilton (book) 400
Accles and Pollock, energy-absorbing steering column 361
stainless steel tube formation 346
Accumulator, lead, by K. A. Dasoyan and I. A. Aguf (book) 426
Acheson, A. R., river control and drainage in New Zealand (book) 276
Acheson Colloids Co., gas igniter 342
lubricant in precision forging 271
Acoustoelectric effects and devices, Engineering Outline 97
Acramizer adaptive control system 474
Adams Bros. & Burnley Ltd., products 65
Adamson-Alliance (Horsehay) Ltd., railway traverser 217
Adaptive control, drilling 522
milling spindle system, Bunker-Ramo 475
systems for machine tools 474
Addison, H., engineers as writers 76. *Letter* 153
Admiralty Marine Engineering Establishment, combustion cell 598
Advanced Passenger Train project 248, 357. *Letters* 282, 330
Advisory Committee on Legal Units of Measurement (ACLUM) 102
AEC Mammoth Major articulated motor vehicle 436
AEI-Elliott Process Automation Ltd., CON-PAC 4020 process computer 623
AEI 500 MW generating sets 616
AEI Scientific Apparatus Ltd., electron microscope 387
Aerials, colour television 513
Goonhilly satellite earth station 164
Aerojet-General Corp. Nerva XE nuclear rocket motor. *Letter* 27
Aerol grinding mills and dryers 367
Aerosol formation from motor-car exhaust 127
Aerospace applications of fluidics 398
Aggregate, marine, handling plant 663
Agriculture. *See* Farm; Tractor
Aguf, I. A., lead accumulator (book) 426
Air, clean. *See* Clean Air
compressed. *See* Compressed Air
Air compressor. *See* Compressor
Air conditioning, gas-fired 88
system design for buildings, by A. F. C. Sherratt (book) 478
Air freight developments 357
Air Industrial Developments Ltd., paint spray booths and ovens 613
Air pollution. *See* Clean air; Pollution
Air traffic control, and air space problem 540
ATS5 satellite experiments 188
satellite communications 540
Air turbine, screwdriver driven by 425
Airbag restraint system 28
Aircraft, automatic landing systems 460
BAC 1-11 boarding procedure 308
Beagle Pup, modifications 407
BOAC requirements 331
Boeing 707 airliner, crash of 155
Boeing 747 airliner, emergency tests 585
Boeing supersonic airliner 331
cargo loader, onboard 385
Computer Aided Approach System 356
Concorde supersonic airliner 180, 585
engines 284
Dornier DO-231 VTOL airliner 519
freight developments 357
Hawker Siddeley 748, for Board of Trade 460
instrument landing systems 460
Jane's all the world's, by J. W. R. Taylor (book) 554
Lockheed TriStar airliner 160, 312
noise of 108
Nimrod marine reconnaissance 212
noise, action against 108
STOL, airliner specification 206
airport locations 356
Trident 3B airliner 538
Vanguard, Merchantman conversion 468
Westland Wasp helicopter 614
see also Air; Airlines; Airport
Aircraft accidents, emergency tests 585
possible extent of 483
Aircraft communications, ATS5 satellite experiments 188
Aircraft engines, Olympus 593 turbojet 284
overhaul, BEOL 337
Rolls-Royce RB 211 turbojet 108, 615
machining centre 574
Spey turbofan 212
see also Gas turbines
Aircraft industry, productivity in 457
Aircraft vibration and flutter, by R. H. Scanlan and R. Rosenbaum (book) 504
Airlines, computer booking for 381
Airports, automatic landing systems 460
baggage handling for 83
conference on (ICE) 356
Manchester, planning report 78
STOL locations 356
Airscrew Weyroc Ltd., engine cooling fan 265
Airships, nuclear propulsion of 564
Aizerman, M. A., pneumatic and hydraulic control systems (book) 44
Alaska, oil drilling explorations 249-51
Albu, A., overseas aid 162
Alcan Aluminium Ltd., levelling line 170
Alcan Industries Ltd., aluminium armoured tank 264
materials stockholders 497
Alcan Porcelloy aluminium-alloy holloware 541. *Letter* 584
Alcock Shearing & Partners, Genesys system 2
Aldous, A. F., pressure vessels conference 262. *Letter* 306
Aldous & Associates, pressure vessels conference 636
Aldridge, E. E., ultrasonic holography 71
Alkathene pipe for water supply 165
Allen, H. G., structural sandwich panels (book) 324
Allen Ygnis Boilers Ltd., butane-fired boiler 115
Allgood, door furniture 309
Allied International Co. Ltd., chemical machining 64
Alloy(s). *See* under specific alloy types
Alloy steel, BS designations 90
Allplas polyolefine balls, for fire-fighting 127
Almond, J. W., beam engines 51
Alpine motor car, Sunbeam 381
Alsamex Products Ltd., corner blocks 445
Alternator, diesel, for light buoy 588
see also Generating sets; Generator
Aluminium, brazing of 14
in electricity distribution and communications industry 185
replacement of copper by 185
Aluminium-alloy holloware, Porcelloy 541
Aluminium armoured car 390
Aluminium cable, in place of copper 310
in power supply 185
Aluminium containers 320
Aluminium smelter, clean air filters for 76
Aluminium strip, levelling line 170
Aluminium telephone cables 185
Alvis Scorpion light tank 264
Amax Iron Ore Corp., Mount Newman scheme 13
America *See* United States
American life and technology, by C. W. Pursell (book) 44
American Society for Metals, forming (book) 276
Amsterdam World Trade Centre 412
Analysis, introductory, by D. S. Jones and D. W. Jordan (book) 604
Andantex Ltd., epicyclic gearbox 42
Anderson, A. H. Ltd., metrication in systems building 166
Anderson, R., electromagnetic theory (book) 630
Andrew Fraser and Co. Ltd., directional control valves 661
Anglesey Aluminium Ltd., clean air filters 76
Anglia Television, colour television 515
Annealing furnace, mesh-belt conveyor 216
Antarctic Survey, British, flexible fuel containers 181
Anti-jack-knife device. *See* Motor vehicle, articulated
Antilok anti-jack-knife device for articulated vehicles, Lockheed 492
Apollo Applications Programme 61, 104
Apollo scientific instruments package (EASEP) 62
Apollo 11 lunar mission 53
comment on 49, 75
contamination control 79
descent and take-off 54
future missions 60
preparatory missions 56
scientific experiments 62
television and photographic equipment 58
vehicles developments 60
Letter 77
Apollo 12 lunar mission 104, 132, 487, 533, 535
hydrogen tank fault 546
television camera failure 561
Letter 610
Apollo-13 lunar mission 637
Appleby Frodingham, cooling blast furnaces 14
Applied heat, by J-B Sneeden and S. V. Kerr (book) 374
Apprenticeship Competition, International (Brussels) 151. *Letters* 282, 534, 584, 610
APT. *See* Advanced Passenger Train project

Arc furnace. *See* Furnace
Arc-plasma spray equipment for thick-film ferrites 623
Archaeology, industrial, of the Lake Counties, by M. Davies-Shiel and J. D. Marshall (book) 630
Archer, S. W., What is an engineer? *Letter* 152
Arcmaker Sprite welding machines 321
Arcturus Electronics Ltd., 18C computer 577
Ardleigh Laminated Plastics Co. Ltd., tank repair 471
Argenti, J., management techniques (book) 452
Arion Ltd., pipelaying under airfield 165
Arlka Air-conditioning Co., gas-fired air conditioning 88
Arm(s), artificial, for bilateral amputees 305
pneumatic circuit-powered 490
Armature, printed, electric motor 196
Armenàkas, A. E., free vibrations of circular cylindrical shells (book) 276
Armoured car, Fox 390
Armstrong, E. G. A., industrial relations (book) 300
Arnfield, R. V., technological forecasting (book) 400
Art, ion-exchange resin regeneration columns 561
Articulated vehicles, anti-jack-knife device 459, 492
Artificial arms, for bilateral amputees 305
pneumatic circuit-powered 490
Ashworth Ross & Co. Ltd., electronic counting 63
Asian Highway. *Letter* 3
Aslib, information retrieval 50
Asphalt and Coated Macadam Association, road construction materials 4
Assemblers and loaders, by D. W. Barron (book) 528
Assembly, automatic, review of 218
mechanized 420
Assembly machines, automatic 420
Associated Container Transportation Ltd., Far East service via Southampton 519
Association, flag ship, cannon from 52
Association of Scientific, Technical and Managerial Staffs 406
Association of Supervising and Executive Engineers 126
Aston Martin, DB6 Mk 2 motor car 208
DBS V8 motor car 383
fuel injection 208
model revisions 418
Aston-Stedall Aluminium Warehouses, materials stockholders 497
Astronomy, 1970 yearbook of, by P. Moore (book) 452
Atkins, W. S., and Partners, probability approach to budgets 50
Atlantic Causeway, roll-on/roll-off container vessel 239
'Atlantic' class steam locomotive 543
Atlantic Conveyor, roll-on/roll-off container vessel 239
Atlas Copco, stone working machinery 168
Atmospheric pollution. *See* Clean air; Pollution
Atomic energy. *See* Nuclear energy
Atomic Energy Research Establishment, electron microscope 387
neutron radiography service 342
Atomic power. *See* Nuclear power
Atomic power station. *See* Nuclear power station
Atomic propulsion. *See* Nuclear propulsion
Atomic reactor. *See* Nuclear reactor
ATS 5 satellite for aircraft communications 188
Auger boring machine, Stihl 165
Austin 1300 GT motor car 364
Austin 1800S motor car 284, 364
Austin Maxi motor car 316, 318
Austin motor car, model revisions 417
Australia, Mount Newman mining scheme 12
Mount Whaleback iron-ore mine 12. *Letter* 178
Automated inspection (book) 504
Automatic(s), bar, with photoelectric control and preset tooling 143
Automatic assembly. *See* Assembly
Automatic control(s), by H. L. Harrison and J. G. Bollinger (book) 172
data acquisition systems 370
digital computer 576
hybrid computer applications 664
output suitable for 40, 144
remote indication and control techniques 476
Automatic dynamic analysis equipment 591
Automatic Letter Facing Machine 259
Automatic transmission in motor cars 443
Automation, in clothing manufacture 592
low cost 25
furniture industry 25, 26
Automation unit for furniture industry 25, 36
Autosensa projector motor-car lamp 409
Auto Union 100 LS motor car 284
Avery, W. & T. Ltd., dynamic balancing machine 367
Aviation Traders (Engineering) Ltd., Vanguard Merchantman aircraft conversion 468
Avon-powered gas turbine 14

B

B Neg drafting system 597
Babtie, Shaw & Morton, pipeline suspended from bridge 90
Bacterial decomposition, farm waste disposal by 570
Badalex Ltd., automatic assembly equipment 218
Baggage handling for airports 83
Bain, D. C., fluidics 398
Baker, H. Wright, workshop technology (book) 44
Baker, Sir John, plastic design of frames (book) 324
women engineers 432
Baker Perkins Ltd., chocolate centres moulding machine 640
schools cooperation scheme 585
Baker, P. J., fluidics 398
Baker, W. J., hot plate defects 179
Balancing, crankshaft, Schenck machine for 367
Balancing machine, dynamic, Schenck 367
Balconi power press 65
Ballscrews, for satellite earth stations 270
preloaded vernier cartridge assemblies 171
Bals, E., crop spraying 86
Bandsaw with magnetic chuck 270
Bank, Lloyds, computer installation 255
Bar automatic, with photoelectric control and preset tooling 143
Bar chart, critical path analysis by, by C. W. Lowe (book) 578
Barge, coupling to dredger 35
Barron, D. W., assemblers and loaders (book) 528
Bassett-Lowke (Railways), model makers 252
Bassøe, B., women engineers 380. *Letter* 432
Bath University, engine research grants 308
Battelle Memorial Institute, hand water pump 263
Battery, fuel cell, applications 486
lead-acid, longer-life 359
nickel-cadmium, for radiotelephone 78
Battery-powered vehicles. *See* Motor car(s); Motor vehicle(s)
Beagle Pup aircraft, modifications 407
Beam pumping engine 51
Bearing(s), journal, in turbomachinery, by D. M. Smith (book) 604
lubrication of, in diesel engines 189
propeller shaft, inboard servicing 414
roller, demagnetization of 318
rolling, lubrication of 63. *Letters* 103, 153
thrust, diaphragm-pad 598
Bearing steels, fatigue tests on 94
Beddoe P. D., Transport Museum 306
Beech Aircraft Corp., hydrogen tanks 546
Beechem's Morton Food, magnetic belt conveyors 38
Beer processing and storage, Watney 240
Bell & Howell A-V Ltd., tungsten-halogen lamps 28
Bell & Howell type C printer 157
Bell Telephone Laboratories, long-life battery 359
Ben Franklin, submersible research vessel 31, 181
Bendix Free-Flex pivot 115
Benn, A. Wedgwood, Ministerial reorganization 379
Ministry of Technology 431
Benton, M., ion exchange resin regeneration columns 561
BEOL. *See* BOAC Engine Overhaul Ltd.
Bergamini, D., mathematics (book) 348
Berger, J & N, Paints Ltd., truck conveyor 165
Berger Traffic Markings Ltd., plastic verge posts 154
Berkeley Nuclear Laboratories, activities 107
Berridge, P. S. A., couplings to the Khyber (book) 172
Berry, M. V., rheology 121
Berth, shipbuilding, covered, Yarrow 396
Besco-Autofold clamping and folding machine 64
Besco Trufold folding machine 65
Besser Co., concrete block moulding machine 448
Best, M. T., engineer-contractors 600
Bibliography of history of technology, by E. S. Ferguson (book) 198
Bicycle wheel, assembly machine 219
Bidston Moss viaduct, for Mersey Tunnel 167
Billet inspection machine, Dunford Hadfields 323
Binks-Bullows Ltd., paint spraybooth 294
spraying machine 318
Binnie & Partners, china clay residues 438
Binocular, pocket, Zeiss 645
Birkenhead Mersey Tunnel approach scheme 82
Birlec Ltd., conveyor furnace 216
Birmingham Museum of Science and Industry 102
Birmingham University, automatic dynamic analysis equipment 591
Bishop Graphics Inc., printed circuit boards 597
Black Arrow X3 satellite 210
Blackhawk Korek for car body repairs 613
Blackman, D. R., SI units in engineering (book) 668
Blackwell, R. F. SI time 126
Blagden, J. F., Management Consulting Services Bureau 458
Blast cleaning of welded tube 140
Blast furnace cooling system 14
Blitz, J., electrical, magnetic and visual methods of testing materials (book) 504
Blowfeed air-turbine-driven screwdriver 425
BMW motor cars for UK 206
BOAC Engine Overhaul Ltd. 337
Boal, G. A., power system economics (book) 630
Board of Trade, automatic landing systems 460
Hawker Siddeley 748 aircraft for 460
BOC-Airco Cryogenic Plant Ltd., natural gas storage plant 433
rail tanker 459
Boden, D., ASTMS 354
Boeing 707 airliner, crash of 155
Boeing 747 airliner, emergency tests 585
Boeing supersonic airliner 331
Bogie, railway freight wagon 440
Boiler, butane-fired 115
fluidised bed prototype 622
oil-fired sectional, Viscount 345
Boiler feed pump, Sulzer 38
Boiler tube, finned steel 38
Bollinger, J. G., automatic controls (book) 172
Bonas Industries, carbon fibre reinforced plastic strips for loom 488
Bonding, silicon chips 19
thermal compression, micro applications 524
Booth, J. D. Livingston, Charities Aid Fund 178
Borg-Warner (Canada) Ltd., aluminium brazing 14
Boring machine, auger, Stihl 165
Bosch Ltd., car test equipment 459
motor-car lamps 409
Boucher, C. T. G., James Brindley (book) 44
Boundary value problems, by F. Chorlton (book) 554
Bourne, Joseph, & Sons, Denby pottery 241
Bovington Airfield, pipelaying 165
Bowen, G. H., Ltd., BAT air re-dryer 644
Bowl feeder, air-operated, Vibron 425
BP Chemical (UK) Ltd., 250
Bradbury Wilkinson & Co., stamp printing 258
Braille reproduction system, computerised 104
Brain drain, comment on 392
Brake, anti-locking, for motorcycles 28
automobile, and braking systems, by T. P. Newcomb and R. T. Spurr (book) 578
locomotive, hand-brake mechanisms 215
Braking effect of gravel beds 355
Brazing of aluminium 14
Breakdown. *See* Accident
Breakwater, floating, Hasler design 287
Brentford Electric Ltd., digital-to-analogue converter 625
Brico Engineering, fuel injection 208
Bridge(s), expansion joints in, by W. Köster (book) 146
medium girder (MEXE) 138
mobile cantilever, for line erection 366
railway, brick replacement with steel 318
steel, conference on (book) 96
Wandsworth, thrust boring construction process 552
Bridge building, thrust-boring abutments in 552
Bridges, Stanley, 4-speed electric drill 290
Brindley, James, by C. T. G. Boucher (book) 44
Bri-Nylon for motor-car trim, Condura Fabrics 407
Bristol Siddeley Engines Ltd., Olympus 593 turbojet engines 284
Britax seat belts 355

British Aircraft Corp., BAC 1-11 boarding procedure 308
Vanguard Merchantman aircraft conversion 468-469
see also Concorde
British Antarctic Survey, flexible fuel containers 181
British Association, inventiveness and innovation 285
multi-discipline activities 281
Presidential Address to Engineering Section 261
weight reduction, R. M. Kenedi 308
British Broadcasting Corp. colour television services 511-18
Heathfield television mast 617
programme-effects generator 519
vhf radio transmission plans 52
British Coal Utilisation Research Association, fluidised-bed boiler 622
British Constructional Steelwork Association, conference on steel bridges (book) 96
British Consumers' Association, *Which?* car tests 266
British Crane & Excavator Corporation Ltd., Coles Model 270 truck-mounted crane 450
British economy, K. S. Reader 203
British Electrical and Allied Manufacturers Association, dielectric properties of insulation 572
Welding Fair (Essen) 321
British European Airways, Trident 3B airliner 538
Vanguard Merchantman aircraft conversion 468
British Federal Welder & Machine Co. Ltd., welding machines and equipment 322
British Hoist & Crane Co. Ltd., Iron Fairy Cairngorm truck-mounted crane 450-1
Iron Fairy Tourmaline telescopic-jib crane 451
Iron Fairy Zircon truck-mounted crane 450
British Hovercraft Corp. 246
British Hydromechanics Research Association, seal test facilities 165
British Insurance Association, car repair research 612
British Iron and Steel Research Association, Control Systems Field Laboratory 623
electroslag refining 39
British Leyland Motor Corp., Austin 1300 GT motor car 364
Austin 1800S motor car 284, 364
Austin Maxi motor car 316, 318
design trends 653
Morris 1800S motor car 284
Motor Show exhibits 417
Paris Motor Show 383
Wolseley-1885 443
Wolseley 18/85 Mark 2 motor car 284
British Mechanical Engineering Confederation, conference on industrial training 281, 405
British mining fields, by J. E. Metcalfe (book) 120
British National Export Council, delays in the dock 102
British Non-Ferrous Metals Research Association, cannon from flag ship *Association* 52
British Nuclear Design and Construction Ltd., Hartlepool nuclear power station 344
British Overseas Airways Corp., butane-fired boiler 115
aircraft purchase speculations 331
British Oxygen Co. Ltd., Falcon cutting machine 322
Hawk profiling machine 322
Mamba pipewelder 322
thermic lance 603
British Petroleum Co. Ltd., activities in USA 249
oil dispersant 433
tanker fleet 250
British racing green, by A. Pritchard (book) 96
British Rail Engineering Ltd., formation 635
British Rail Hovercraft Ltd., passenger services 245
British Railways, Advanced Passenger Train project 248, 357. *Letters* 282, 330
advanced warning system 127
automatic signalling 544
derailment at Darlington 331
engineering problems 413
freight wagons 440
glued rail joint 263
management structure 635, 636
molten iron transfer trains 165
railway track fixing methods 29
signalling, O. S. Nock (book) 146
Southern Region in '70s 586
Transport Museum (Clapham and York) 125, 154. *Letters*, 262, 306
see also Flying Scotsman
British Scientific Instrument Research Association 41
automated inspection (book) 504
automated inspection conference 103. *Letters* 77, 152
automation in clothing industry 592
British Standards Institution, alloy steel designations 90
cables (metric units) 445
engineering drawing practice. *Letter* 103
ISO limits and fits 294
screw conveyors, trough type 115
British Steel Corp., Inter-Group Laboratories 623
molten iron transfer trains 165
British Steel Piling Co. Ltd., Rockbreaker machine 318
British Trade Drive, California 509
Brixton, town centre development 28
Broken Hill Proprietary, Mount Newman scheme 12
Bromberg, F. V., matrix analysis of discontinuous control systems (book) 172
Bronx Process Engineering Co. Ltd., roll forming machines 65
Brook Motors Ltd., reluctance motors 627
Brookes, R. P., Industrial Training Act 405
Broom & Wade Ltd., activities and products 68
Brown, G. Spencer, laws of form (book) 324
Brown, John, Engineering Ltd., industrial gas-turbines 494
Brown, K., Mersey Tunnel feeder roads 167
thrust boring 552. *Correction* 597
Browne, R., gear wear 432
Brulé Waste Control Ltd., sewage sludge incineration 360
Brunner Machine Tools Ltd., tool and fixture storage 394
Brush Clevite gas igniter 342
Bryant Symons & Co. Ltd., diamond tool lathes 550
Brydson, J. A., plastic materials (book) 504
Brymbo Steel Works, furnace roof rings 294
BSA, motor tricycle 104
Rocket 3 motorcycle 237
Buchanan, Colin, & Partners, tracked hovercraft 545
Budgets, probability approach to 50
Buffa, E. S., modern production management (book) 20
Building(s), air conditioning system design for, by A. F. C. Sherratt (book) 478
industrialised, Jesperson 12M system of 520
Swiftplan's system 115
metrication in 166
on springs, by R. A. Waller (book) 374
see also Concrete
Building Exhibition, International (Olympia) 520
Building industry, materials trends 520
trends in 520
Building maintenance, profitable (book) 324
Building Marketing Consultancy Ltd. 520
Building Research Station, information retrieval 50
Building site services, co-ordination of 521
Bulk materials, pneumatic handling of, development laboratory 502
Bundred, J., geology for engineers (book) 604
Bunker-Ramo adaptive control milling spindle system 475
Bunshah, R. F., metals research (book) 348
Buoy, navigational light, automatic 588
Burgess Products Co. Ltd., woodworking machine 290
Burmah-Castrol Industrial Ltd., skin complaints 191
Burners, gas, galvanizing bath 142
paint shop heating 296
Nu-Way A-type 345
Nu-Way forced-draught 115
Burnett, D., SET 432
Burnley Football Club, heated stand 535
Burns, N., silicone rubber membranes 441
Burrows, R. G., photon detectors (book) 554
Burrows, W. N., building site services 521
Burt, R., Cornish mining (book) 374
Buses, computer control for, Marconi 433
Butane-fired boiler 115
Butler Machine Tool Co. Ltd., planing machine 347
Butyl Products Ltd., Hydrox Digester 570
Byars, E. F., engineering mechanics of deformable bodies (book) 504

C

C-5A aircraft. *See* Lockheed
Cable(s), aluminium, in power supply 185
to replace copper 310
B.S. (metric units) 445
coaxial, fault location 471
copper, replacement by aluminium 310
electricity, cryogenic underground 471
installation in Woodhead tunnel 470
fibre optics 434
stable superconducting, Engineering Outline 45
telephone, aluminium 185
underground power, detector device 572
see also Power transmission
Cable drum handling, articulated trailer 419
Cadburys, Chirk chocolate factory 288
Roses chocolates 640
Cadillac Fleetwood Eldorado motor car 211
Cage, S. A. J., unit of mass 534. *Letters* 51, 204, 584, 610
California, British Trade Drive 509
Calladine, C. R., engineering plasticity (book) 426
Calzia, J., les substances explosives et leurs nuisances (book) 578
Cam, shaped, in program control 41
Cam-grinding machine, numerical control 602
Cam-profile turning lathe 92
Cambridge Fender & Engineering Co. Ltd. 10
Cambridge University, engineering graduates' survey 392
Cameras, for Moon landing mission 58
miniature bore-inspection 587
Camlab (Glass) Ltd., drinks heater/cooler for motor cars 4
Cammidge, S. E., plant unit specification 484
Can handling by magnetic belt conveyor 38
Canal, Thames and Severn, by H. Household (book) 70
Canary Islands, power station 181
Cannon from flag ship *Association* 52
Capper, P. L., mechanics of engineering soils (book) 120
Capri motor car. *See* Ford
Capricorn Industrial Services, plastic balls for fire-fighting aid 127
Car, motor. *See* Motor car
Carbon fibre reinforced plastics. *See* Plastics
Carburation, by C. H. Fisher (book) 146
Carburettor tuning devices 33
Career, second, F. B. Willmott 307
Cargo, railway, securing by Load-Lok winch 191
Cargo handling, continuous chain apron 90
Cargo loader for freight-carrying aircraft 385
Cargo ship. *See* Ship
Carpentry and joinery, advanced, by F. Hilton (book) 578
Carrier Engineering Co. Ltd., paint shop at Ryton 295
Carroll-Porczynski, C. Z., advanced materials (book) 120
Carruthers, J. H., & Co. Ltd., Cub Monobox cranes 369
Cassie, W. F., mechanics of engineering soils (book) 120
Cast iron, spheroidal-graphite, for boiler 345
Casting, continuous, in Japan 191
stator-case, shell moulding of 419
Vitkovice Steel 11
Ceewrite Indicator Manufacturing Co. Ltd., torque-limiting clutch. *Correction* 63
Cement and Concrete Association, concrete grooving 572
road construction materials 4
slip paver 297
Cementation Ground Engineering Ltd., prepackaged sand drains 597
Cementation Piling & Foundations Ltd., bored piles for Mersey Tunnel road system 167
Central Dynamics Ltd., colour tv control system 515
Central Electricity Generating Board, conference on thermal stresses and thermal fatigue 306
construction programme 509
mobile cantilever bridge 366
nuclear power stations 5
plant failures 616
power station efficiencies 154
power station programme 622
Woodhead tunnel cable circuits 470
see also Power station(s)
Central heating. *See* Heating
Ceramic industry, health conditions in, by C. N. Davies (book) 578
Ceramic nuclear fuels, Sol-gel processes for (book) 70
CERN, digital-to-analogue converter 625

Ceruti, European Machine Tool Exhibition 17
Chain, slat band, Coventry Mark 43
Chain apron for cargo handling 90
Challenger motor car. *See* Dodge
Channel Tunnel, prospects of 75. *Letter* 204
Chapman, J. C., powered limbs 490
Charities Aid Fund 178
Charlton, F. G., hydraulic models 375
Chase Machine Tools Ltd., European Machine Tool Exhibition 17
Chemical industry, fluidics in 399
Chemical machining equipment 64
Chemical thermodynamics, by P. A. Rock (book) 554
Cherpin M., advanced passenger train 330
China, historical civilization of, by J. Needham (book) 348
China clay industry, Cornwall, waste disposal 438. *Letter* 534
Chivers, S. & Co., onion peeling machine 585
Chocolate centres moulding process 640
Chocolate making factory 288
Chorlton, F., boundary value problems (book) 554
Chrysler Corp., Dodge Challenger motor car 206
Chuck, magnetic, bandsaw with 270
Churchill Automatic Assembly Ltd., bicycle-wheel building machines 219
Blowfeed screwdriver 425
Churchill, Charles, Ltd., gear-shaving machine 667
Churchill Machine Tool Co., European Machine Tool Exhibition 18
grinding machines 118
Cigarette making machinery 642
Cincinnati Milling Machines Ltd., Acramizer adaptive control system 474
Cinema film. *See* Film
Cintel, colour television equipment 517-8
Citroen, DS21 motor car 382
ID 20 Confort motor car 186
Wankel rotary engine 561
City of London, north bank scheme 26
City University, research activities 574
Civil engineering industry, tax system 76
CJB (Projects) Ltd., Chirk chocolate factory 288
Cladding, steel sheet for 342
Clark, Bernard L., & Partners, Foulness scheme 566
Clark, D., plane and geodetic (book) 630
Clarke, R. A., rolling bearing lubrication 103. *Letter* 153
Clayton, D., electric cables 584
Clean Air Conference (Eastbourne) 464
Clean air filters for aluminium smelter 76
Cleaning, blast, of welded tube 140
nuclear fuel elements 433
Cleansing, public, by F. Flintoff and R. Millard (book) 528
Clothing manufacture, automation in 592
Clutch, Power Transmission Exhibition 42
torque-limiting. *Correction* 63
see also Coupling
Coach, LMS, 1923-1957, by R. J. Essery and D. Jenkinson (book) 604
Coastal hydraulics, by A. M. M. Wood (book) 426
Coatings, non-stick, for aluminium-alloy holloware 541
Cocoa bean processing plant 288
Code, postal, use in letter sorting 259
Coils, dielectric properties of insulation 572
Coles Model 270 truck-mounted crane 450
Collision. *See* Accident
Colortune 2 carburettor tuning device 33
Colour film, processing laboratories 156
Combustion cell, double vortex 598
Combustion Engineering Inc, tanker boilers 38
Commercial Motor Show (Earls Court) 355
Communication(s), aircraft, ATS5 satellite experiments 188
and radar, mechanical engineering in, by C. J. Richards (book) 222
defence, spacecraft ground stations 311
difficulties of, M. F. Robertson 362
future trends, A. Reeves 434
optical systems, Engineering Outline 277
Compressed air, applications of 68
See also Pneumatic
Compressors, production and applications, Broom & Wade 68
Computer(s), analogue, as simulation tool 664
Arcturus 18C 577
combined optical and electronic 423
digital, as simulation tool 665
process control 576
Digital Equipment PDP8/L & I 576
domestic applications 433
Elliott 905 on-line process 545
fingerprint coding by 358
for Braille reproduction system 104
GEC-Elliott-903 545
Genesys structural engineering system 2
Hawker Siddeley Dynamics DCC-2 577
Helwett-Packard 'ten-figure slide rule' 576
Honeywell '16' series 577
Honeywell H316 371, 433
hybrid, as simulation tool 664
process control applications 665
IBM System-360 model-30 272
IBM 360/65, for Lloyds Bank 255
ICL 1901, for Pricerite 181
in kitchen 433
in railway signalling 544
in semiconductor production 368
in universities 2
man and, by J. Diebold (book) 578
Marconi Myriad II 433
Modular One system 577
optical, advantages of 423
prospects of 423
process, CON-PAC-4020 623
real-time digital 576
small digital, applications 576
time shared, *Mobidic* 522
Computer Aided Approach System 356
Computer Board for Universities and Research Councils 2
Computer booking for airlines 381
Computer control for buses, Marconi 433
Computer language, Fortran 576
Computer peripheral devices, Engineering Outline 579
Computer program(s), supermarkets 181
Computer programming systems, numerical control 192
Computer prophets, by J. M. Rosenberg (book) 478
Computer Technology Ltd., Modular One system 577
Computer users' year book 1969 (book) 276
Concorde supersonic airliner 180, 585
engines 284
Concrete, accelerated curing 422
grooving while wet 572
Concrete blocks, high strength structural 448
Concrete handling, Mocon conveyor 117
Concrete mixing plant, Portabatcha 503
Concrete pump, mobile unit 471
Concrete road, slip paver 297
Concrete shuttering, polystyrene blocks as 191
Concrete vessels, tensioning device for 344
Concrete wharves in Norwegian waters, by O. E. Gjorv (book) 324
Condenser, separate, James Watt and, by R. Law (book) 146
Conductors, railway track, for automatic signalling 544
Condura Fabrics Ltd., Bri-Nylon for motor-car trim 407
Conference, airports, the way ahead (ICE) 356
Clean Air (Eastbourne) 464
engineers that industry wants 177
industrial training (BRIMEC) 281
International Machine Tool (Manc. at) 329, 446
Pressure Vessels Authority (Manchester) 262, 583. *Letters* 306, 636
SI units, PERA (Brussels) 15. *Letter* 50
steel bridges (book) 96
terrain vehicle systems (Essen) 89
thermal stresses and thermal fatigue (Berkeley) 306
Confor continuous card forms 181
Congress, European Glass Federations 407
Connolly, R., group technology 446
CON-PAC 4020 process computer 623
Conservation of mass energy, by J. C. Whitwell and R. K. Toner (book) 120
Construction industry, information retrieval 50
marketing in 520
Consulting engineers, tax system 76
Consumers' Association, *Which?* tests on corkscrews 659
Container(s); aluminium 320
construction requirements 319
exhibition (Earls Court) 319
insulation of 320
material selection for 319
plywood laminate 320
steel 319
working conditions of 319
Container handling, exhibition (Earls Court) 319
Container services, Southampton-Far East 519
Container ship, *Atlantic Causeway* 239
Atlantic Conveyor 239
nuclear propulsion of 536
Contract forms, ICE, by M. W. Abrahamson (book) 222
Contractors, engineer, activities of 600
Control, automatic. *See* Automatic control
light, of bar automatic 143
of events 40-1
remote, techniques for 476
Control problems, steel plant, on-site analysis 623
Control systems, by B. O. Watkins (book) 554
discontinuous, matrix analysis of, by P. V. Bromberg (book) 172
hydraulic, by M. A. Aizerman (book) 44
optimal, by J. Matyas (book) 70
pneumatic, by M. A. Aizerman (book) 44
see also Automatic control
Control Systems Field Laboratory 623
Converter, digital-to-analogue 625
Conveyor, cargo handling, continuous chain apron 90
chain, Rackveyor 448-9
concrete-handling, Mocon 117
magnetic belt, for can handling 38
mesh-belt, annealing furnace 216
screw, trough type, BS 115
television monitor 497
truck system 165
Conveyor belting, anti-dazzle 165
Coolers, self-regulating Joule-Thomson 497
Cooling system, electric, Fiat-128 motor car 443
Cooper-Bessemer, Avon-powered gas turbine 14
Cooper Car Co., mid-engined motor car 105
Cooper, G. G. J., engineers as writers 153
Copper, replacement by aluminium 185
Copper cable in place of aluminium 310
Copper industry, Zambia 185
Coras Iompair Eireann, Load-Lok winch 191
Cordero, H. G., and R., iron and steel works of the world (book) 96
Corey, R. C., incineration (book) 578
Corkscrews, *Which?* tests on 659
Corner blocks for package cushioning 445
Cornish mining, by R. Burt (book) 374
Cornwall, china clay industry, waste disposal 438. *Letter* 534
Corporate strategy and technological forecasting, by G. Wills *et al.* (book) 324
Corrosion, electrical, gear wear 666
soil, of titanium 661
Cosmopolitan passenger/materials hoist 117
Cost analysis, function, Engineering Outline 529
Costain Blankevoort (UK) Dredging Co. Ltd., suction dredgers 35
Costain Civil Engineering Ltd., Hong Kong harbour tunnel 2
Costain, Richard Ltd., Kings Worthy link road 181
Costing, engineer's guide to (book) 120
Cosworth-Ford Formula-1 motor car 135
Council of Engineering Institutions, conference on engineers that industry wants 177
guidelines on training 509
Counter, revolution 144-5
Counting scale, electronic, for nuts and bolts 63
Couplings, instrumentation, Series-35 547
of ships at sea 35
Power Transmission Exhibition 42
to the Khyber, by P. S. A. Berridge (book) 172
see also Clutch
Courtburn Positioners Ltd., universal positioner 216
Coventry Mark slat band chain 43
Cox, E. S., world steam in the 20th century (book) 96
Crack testing, motor-vehicle steering system 389
Crane(s), mast, Jones 1080 Series of 451
mobile, review of 450
overhead, Cub Monobox 369
telescopic-jib, Iron Fairy Tourmaline 451
truck-mounted, Coles Model-270 450
Iron Fairy Cairngorm 450-1
Iron Fairy Zircon 450
Crane weigher, Salters 548
Cranfield College of Aeronautics, parcel sorting 343
Crankshaft balancing, Schenck machine for 367
Critical path analysis by bar chart, by C. W. Lowe (book) 578
Crompton Leyland Electricars, battery-driven vans 567

Crop spraying, ultra-low volume 86
Crowley, E., drilling rigs 111
Cryogenic underground cables 471
Cryogens in high vacuum production, Engineering Outline 223
Cryogettering, Engineering Outline 223
Cryopumping, Engineering Outline 223
Cryosorption, Engineering Outline 223
Crystals, electro-optic, Engineering Outline 147
C. S. Forrester, stern trawler 206
Cunard-Brocklebank Ltd., formation and activities 238
Cunningham, J. vectors (book) 70
Cutting machines, exhibits (Essen) 321
Falcon, BOC 322
oxygen, Han-co-ordinate 321
Cutting oils, skin complaints by 191
Cutting process, metal, adaptive control systems 474
Cycle. *See* Bicycle
Cycle, motor. *See* Motor cycle

D

Daimler Fox armoured car 390
Daimler Sovereign motor car 381, 417
Dale, B., grass-cutting machine 80
Dam, collapsible, N. Holland 313
Dampier Mining Co. Ltd., Mount Newman scheme 13
Danfoss, mixing valve 309
Dare, D. W. F., metric abbreviations 51
Darling, A. E., electrical engineering (book) 300
Dasoyan, K. A., lead accumulator (book) 426
Data acquisition systems 370
Data logging, installation of system 273
Dataset Ltd., Confor continuous card forms 181
Datsun 1000 motor car 568
Davies, C. N. health conditions in ceramic industry (book) 578
Davies-Shiel, M., industrial archaeology of the Lake Counties (book) 630
Day, J. R., nickel crisis 523
Decompression chamber for diving bell 333
Defence communications, spacecraft ground stations 311
Defence equipment, metrication 26
Deformable bodies, elementary mechanics of, by J. O. Smith and O. M. Sidebottom (book) 20
engineering mechanics of, by E. F. Byars and R. D. Snyder (book) 504
Deformation strain and flow, by M. Reiner (book) 324
De Garmo, E. P., materials and processes in manufacturing (book) 146
Degen, J., machine tool technical criteria 447
Degenhardt & Co., pocket binocular 646
Degerlund, B. R., parcel sorting 343
De-icing equipment for trawlers 104
Delaney Gallay Ltd., press for fluid forming 115
Delta tube weld mill 367
Demagnetization of roller bearings 318
Denby pottery, fast-firing kiln for 241
Deneaut, H. H., mysteries of the skies (book) 426
Denniff, Alan S. Ltd., marine aggregate plant 663
Dennis L. J., engineering drawing practice. *Letter* 103
Depth measurement, process control system 419
Design, industrial, comment on 309
modular, Engineering Outline 21
plastic, of frames, by Sir John Baker and J. Heyman (book) 324
Design bank, H. G. Harris 447
Design data, thermoplastics, Engineering Outline 173
Design exhibition (London) 309
Design problems and their solutions, by S. W. Jones (book) 348
Design process, communication channels with production process 446. *Correction* 661
Diaborit diamond saw blades 169
Diamond drill, use in rock drilling 169
Diamond saw blades, Diaborit 169
Diamond tools, turning with 549
Dictionary of fuel technology, by A. Gilpin (book) 604
Die-handler truck, battery-operated 624
Die-set and punch tooling 65
Diebold, J., man and the computer (book) 578
Dielectric properties of insulation 572
Dielectric relaxation, Engineering Outline 325. *Correction* 330
Diesel alternator for light buoy 588
Diesel engine, General Motors 4-53T two-stroke 265
lubrication of bearings in 189
noise reduction 189
Stork-Werkspoor TM410 527
two-stroke, small-end problems 189
Differential, balanced traction (BT) 133. *Letters* 178, 262, 330
Digital Equipment Corp., Computerpacks 576
PDP8/L & I computers 576
Digital readout, OTE/Galileo Micro 17
Digital-to-analogue converter 625
Diodes, junction, as oscillators, Engineering Outline 505
Direct digital control system, Honeywell 371
Directional control valves, K & L 661
Directories, current European, by G. P. Henderson (book) 452
Disabled persons, three-wheeler car conversions 207
Disaster(s), planning for 483
emergency and, by R. J. Healy (book) 528
Dispersol OS for oil pollution 131
Dissenters, mutterings of 153
Distington Engineering Co., molten iron transfer trains 165
District heating. *See* Heating
Diving bell, Strongwork 332
Dixon, Peter, and Son Ltd., Verti-Forma paper-making machine 384
Do-it-yourself Exhibition (Olympia) 284, 290
Docks, delays in (leaflet) 102
St Katharine, redevelopment scheme 590
storage and unloading, for C-5A Galaxy aircraft 496
Documentation, standardization for, by B. Houghton (book) 70
Docutel Corp., baggage handling system 83
Dodge Challenger motor car 206
Door, for shipbuilding berth 397
synthetic materials 407
Door furniture, Allgood 309
Dornier DO-231 VTOL airliner 519
Double glazing, and heating economics 462
Douglas-Rownson Ltd., cargo handling 90
Dow Chemical Co. Ltd., corner blocks 445
Dowty roof-support test rig 394
Dragon nuclear reactor project 5
Drain(s), sand, prepackaged 597
Drainage and river control in New Zealand, by A. R. Acheson (book) 276
Drawing, engineering, practice, BS. *Letter* 103
Dredgers, coupling barge to 35
suction, twin-hopper 35
Dredging, marine aggregate 663
Drier. *See* Dryer
Drill, diamond, use in rock drilling 169
electric, Bridges 290
Wolf Sapphire-70 291
Drilling, adaptive control of 522
rock, methods and machines 168
Drilling machines, rock, Atlas Copco 168
Drilling platforms and rigs, Elfocean 594
Pentagone-81 semi-submersible 111
structural analysis 111-2
Drinks heater/cooler for motor cars 4
Drive, four-wheel 134
magnetic, in speed control 144
variable-speed 43
Driving, manual on, MOT 561
Drummond, J. R., differential 262
Dryer, pneumatic tyre support and drive 367
tobacco, BAT air re-dryer 644
Duckworth, W. E., electro-slag refining (book) 604
Duffy, F., office landscaping (book) 198
Dummer, G. W. A., fluidic components (book) 96
Dunford Hadfields Ltd., billet inspection machine 323
embossing rolls 65
Dungeness nuclear power station 38
Dunlop, D75 cross-ply tyre 386
Maxaret anti-jack-knife device for articulated vehicles 459, 492
microwave preheater 367
SP111 radial-ply tyre 386
wheel design and production 158
Durrant, A. E., Garratt locomotive (book) 70
Dutch Power Corp., natural-gas gas turbine 38
Dynamic analysis, automatic equipment 591
simplified models 194
Dynamic loads, mechanical behaviour of materials under, by U. L. Lindholm (book) 172
Dynamical equivalence of lumped masses 194
Dynamometer, sun, and electronic engine tester 613
Dytch, A. K., locomotive design 215

E

Eaglesfield, C. C., electro-optic crystals 147
Earth-moving equipment, paint spraybooth for 294
Eastern Airlines, STOL airliner specification 206
Eastman Kodak, colour film processing 157
Easton & Johnson Ltd., Reamaster paper cutting and collating machines 662
Eastop, T. D., applied thermodynamics (book) 668
Economic Commission for Europe, engineering products requirements 26
Economics, power system, by E. O. Penshaw Taylor and G. A. Boal (book) 630
Economy, British, K. S. Reader 203
Edilon NV, glued rail joint 263
Education, basic general, and man-power requirements 305
colour television in 518
of engineers, H. M. Finniston 261
Edwards, F. J., Ltd., Balconi power press 65
Besco-Autofold folding machine 64
Besco Trufold folding machine 65
Edwards, G. D., anti-jack-knife devices 492
articulated commercial vehicles 436
Austin Maxi motor car 316
automatic signalling 544
BSA Rocket 3 motorcycle 237
Building Exhibition 520
car design 1959-69 653
car power trends 364
car reliability 416. *Letter* 484
car repair research centre 612
car wheels 158. *Letter* 406
carburettor tuning device 33
Citroen ID20 motor car 186
Clean Air 464
crop spraying 86
Datsun 1000 motor car 568
Denby pottery kiln 241
differential 133. *Letters* 178, 262, 330
district heating 8
dynamic analysis equipment 591
effluent process plant 620
electronic fuel injection 208
energy-absorbing steering column 361
farm waste disposal 570
floating breakwater 287
Ford Capri motor car. *Letter* 3
four-wheel drive 134
freight wagons 440
General Motors models for 1970 211
Lotus + 2 'S' motor car 655
lubricating oil plant 32
mid-engined cars 105. *Letter* 153
Motor Show 417
Porcelloy holloware 541. *Letter* 584
refuse disposal 293
Renault 12 motor car 339
Scimitar GTE motor car 466
sewage sludge incineration 360
Skoda developments 11
Triumph TR6 motor car 84
tyres 386
Vauxhall proving ground 184, 619
waste disposal 596
winter road conditions 465
Edwards, Sir George, international cooperation 329
Edwards Vacuum Components Ltd., vacuum pump 346
Effluent process plant, potato products 620
Egerton, H. B., non-destructive testing (book) 172, 452
Eggborough power station, plant failures 616
Eiloart, T. M. B., modular design 21
Eimco (Great Britain) Ltd., water purification plant 620
Eisler (Consultants) Ltd., heating foil 421
Elasticity, fracture and flow, by J. C. Jaeger (book) 668
Electric furnaces. *See* Furnace
Electric haulage, underground, by L. Szklarski *et al.* (book) 172
Electric motor, for high temperatures 572
linear-induction 14

Mez 11
printed armature 196
reluctance 626
superconducting 597
Electric Power Storage Ltd., fuel cell 486
Electrical engineer(s) and workers, by P. W. Kingsford (book) 400
Electrical engineering, by A. E. Darling (book) 300
Electrical methods of testing materials, by J. Blitz, *et al.* (book) 504
Electrical plant, heavy, price structure 509
Electrical power. *See* Electricity; Power
Electrical power engineering, theory of similarity and simulation with applications to problems in, by V. A. Venikov (book) 478
Electrical remote indication and control 476
Electrical technicians, engineering principles for, by K. M. Smith and P. Holroyd (book) 554
Electricity Council, mobile cantilever bridge 366
power system protection (book) 348
Electricity supply(ies), domestic tariff trends 410
Electricity supply industry, amalgamation with gas, proposal 151
Electro-chemical machining, ac operation 270
Electro-erosion machining, conference on, Wickman 63
Electro-Hydraulics Corp., electro-spark metal forming machine 140
Electromagnetic theory, by K. Foster and R. Anderson (book) 630
Electromechanical remote indication and control 477
Electron microscope, AEI 1 MV type EM7 387
Electronic counting scale for nuts and bolts 63
Electronic engine tester, Sun 613
Electronic remote indication and control 477
Electronic washing machines 589
Electro-optic crystals, Engineering Outline 147
Electro-slag refining, by W. E. Duckworth and G. Hoyle (book) 604
Electro-slag refining technology, BISRA 39
Electro-spark forming machine 140
Elfocean oscillating drilling platform 594
Elga, ion exchange resin regeneration columns 561
Elliott, D. E., fluidised-bed boiler 622
Elliott 905 on-line process computer 545
Ellis, B., basis concepts of measurements (book) 70
Ellis, John, & Sons Ltd., safety kerb 611
Elox electro-erosion machines 63
Elsen and Drahtwerke Erlau AG, tyre protecting chain 309
Elstub, St John, aircraft industry 457
Embossing rolls, Dunford Hadfields 65
Emco Star woodworking machine 290
Emergency and disaster planning, by R. J. Healy (book) 528
EMI, robot tractor 624
Employment. *See* Labour
Emulsion production, Nozljector machine for 318
Enamel, porcelain, for aluminium-alloy holloware 541
Endo, F., parts family manufacturing method 447
Energol accelerated quenching oils 275
Energy, by M. Wilson (book) 348
Engine(s), aircraft. *See* Aircraft engine
internal combustion, testing of, by A. B. Greene and G. G. Lucas (book) 504
motor-car *See* Motor-car engine
petrol, Jaguar XK, for Scorpion tank 265
rotary. *See* Rotary engine
traction, worth modelling, by W. J. Hughes (book) 504
Engineer(s), as writers 25. *Letters* 76, 153
supply and demand relation 177
that industry wants, conference 177
trade union 126, 204, 354
what is an? *Letter* 152
women, in Norway 380. *Letter* 432
work of, film on 635
see also Civil; Electrical; Mechanical, etc.
Engineer contractors, activities of 600
Engineering, Reader Enquiry Service 307
Engineering, wonderful world of, by D. Jackson (book) 668
see also Civil; Electrical; Mechanical, etc.
Engineering contract. *See* Contract
Engineering design. *See* Design
Engineering drawing. *See* Drawing
Engineering education. *See* Education
Engineering graduates, Cambridge, survey of 392
Engineering Industry Training Board 281, 405
levy-grant scheme 635
Engineering mechanics of deformable bodies, by E. F. Byars and R. D. Snyder (book) 504
Engineering Outline, abrasive wear 479
acoustoelectric effects and devices 97
computer peripheral devices 579
cryogens in high vacuum production 223
dielectric relaxation 325. *Correction* 330
electro-optic crystals 147
frequency and time analysis 605
function costs analysis 529
hydraulic models of rivers and waterways 375
interfaces in solids 427
junction diodes as oscillators 505
megagauss magnetic fields 453
microwave Gunn effect oscillators 401
modular design 21
optical communication systems 277
pulse echo ultrasonics 555
pulsed neutron techniques 301
quality and reliability. *Letter* 484
random processes 349
rate processes 631
rheology 121
semimetals 669
silicone rubber 199
stable superconducting cables 45
thermoplastics design data 173
ultrasonic holography 71
Engineering plasticity, by C. R. Calladine (book) 426
Engineering principles for electrical technicians, by K. M. Smith and P. Holroyd (book) 554
Engineering products requirements, Europe 26
Engineering science at the university, by D. Hutchings (book) 478
Engineering soils, mechanics of, by P. L. Capper and W. F. Cassie (book) 120
Engineers (Sutton) Ltd., hydraulic valve panel sections 63
English Electric-AEI Turbine Generators Ltd., power station for Canary Islands 181
power station for South Korea 355
steam valve chests 90
English Electric Co. Ltd., railway traverser 217
Enots Ltd., pneumatic equipment 115
Epoxy plastic, Nitomin Z 522
ERF 44-ton articulated motor vehicle 436
Ernault-Somua, H., European Machine Tool Exhibition 17
Escalators, optical illusions 485. *Letters* 510, 584
Escort motor car. *See* Ford
Escritt, L. B., sewer and water-main design tables (book) 668
Essery, R. J., LMS coach 1923-1957 (book) 604
Esso Petroleum Co. Ltd., Fawley-West pipeline 342
Estimation theory and applications, by N. E. Nahi (book) 478
Etching machine, spray 64
Eurogauge Co. Ltd., process control system 419
European Glass Federations, annual congress 407
European Machine Tool Exhibition (Paris) 17
Evans, A., data acquisition systems 370
Events, control of 40-1
Excavator, Hy-mac, design of 309
Exhaust, motor car, atmosphere pollution 127
Exhaust valve. *See* Valve
Exhibition, Building, International (Olympia) 520
Commercial Motor Show (Earls Court) 355
design (London) 309
Do-it-yourself (Olympia) 284, 290
Flying Scotsman locomotive, export tour of 128, 154, 179, 227-59, 331
Machine Tool, European (Paris) 17
Motor Show (Earls Court) 417, 442
Motor Show (Paris) 382
power transmission engineering (London) 42
Sheet Metal (London) 64
Welding and Cutting Fair (Essen) 321
Exico Ltd., market developments 11
Expansion joints in bridges and roads, by W. Köster 146
Experimental route guidance system (ERGS) 308
Explosives and safety precautions, by J. Calzia (book) 578

F

Facsimile machine proposal 611. *Correction* 637
Factory accident. *See* Accident
Factory management, by K. G. Lockyer (book) 20
Falcon cutting machine, BOC 322
Falconbridge Nickel Mines, nickel supplies 523
Falk, M. & Co. Ltd., ultrasonic tester 116
Fan, engine cooling, Airscrew Weyroc 265
Faraday cage lineman's conducting suit 341
Fareham, steel bridges on A27 road 318
Farm waste disposal by bacterial decomposition 570
Farquharson, F. K., freight wagons 440
Fascia parts, automatic spraying 318
Fatigue, thermal, conference (Berkeley) 306
Fatigue test(s) on bearing steels 94
Fatigue testing machine, programmed variable load 56
Unisteel 94
Fawley power station, superconducting motor 507
Febetron radiant light emission units 342
Feed rate, adaptive control systems 474
Feeder, automatic sheet, Geco 473
bowl, air-operated, Vibron 425
Feilden, G. B. R., metrication. *Letters* 51, 153
SI units 3
Fender, Cambridge unit 10
pneumatic, Firestone Burleigh 10
Ferguson, E. S., bibliography of history of technology 198
Ferguson, Harry, Research, four-wheel drive 134
Ferranti Ltd., European Machine Tool Exhibition 18
n-c interests sale to Plessey 635
Ferrar, W. L., advanced mathematics for science (book) 426
Ferrites, thick-film, APS technique 623
Fiat, half-share in Ferrari 4
motor car range 4
Motor Show exhibits 418
Fiat-128 motor car 418
electric cooling 443
Fibre optics in communications 434
Fidelle, J. P., L'hydrogene dans les metaux (book) 68
Field, A. J., oxygen from the atmosphere 610
Field Emission UK Ltd., Febetron radiant light emission units 342
FieldTech Ltd., Fre-Flex pivot 115
Fighting Vehicles Research and Development Establishment, Fox armoured car 390
Film, cinema, on engineers' work, ICE 635
colour, processing laboratories 156
photographic, for Moon landing mission 59
Film processor, automatic, Pako 389
Film studios, equipment developments 109
Filters, clean air, for aluminium smelter 76
Financial Times Industrial Architecture Award 609
Finch, B. J., traction engines (book) 300
Fingerprint coding by computer 358
Finniston, H. M., social consequences of technology 261
Fire-fighting, Allplas polyolefine balls for 127
Fire protection equipment, racing cars 127
Fire services, London Airport 155
Firestone Burleigh pneumatic fender units 10
Firth, B. W., vehicles for rough terrain 89
Firth, I., high vacuum using cryogenic liquids 223
stable superconducting cables 45
Fischer, George, Ltd., European Machine Tool Exhibition 17
Fish processing, research 207
Fisher, C. H., carburation (book) 146
Fisher, D., A. H. Anderson Ltd. 166
BP's activities in USA 249
Cunar J-Brocklebank 238
inventiveness and innovation symposium 285
model makers 252
Seaspeed hovercraft 245
SI units 15. *Letter* 50
Fishing vessels. *See* Trawlers
Fishlock, D., superconductivity (book) 604
Fitzgeorge, D., kilogramme 610
Fixtures, storage, Vidmar system 394
Flame proofing on process plants 399
Flame-spraying, nickel coatings 623
Flanagan, T. P., instrument research 103. *Letter* 152
Flintoff, F., public cleansing (book) 528
Floating breakwater, Hasler design 287
Flood precaution plans, Thames Conservancy 486
Flood protection constructions 313
Flow, and deformation strain, by M. Reiner (book) 324
elasticity and fracture, by J. C. Jaeger (book) 668
recirculating, heat and mass transfer in, by A. D. Gosman *et al.* (book) 222

Flow turning of metals, by J. A. Grainger (book) 120
Flowmeter, taper-tube 141
Fluid forming unit, Saab 115
Fluid machinery and fluid mechanics, proceedings of the third conference on (book) 554
Fluid mechanics and fluid machinery, proceedings of the third conference on (book) 554
Fluidic components, by G. W. A. Dummer and J. M. Robertson (book) 96
Fluidic devices, supersonic 399
Fluidic elements, types of 398
Fluidic sensors, advantages 398
Fluidics, aerospace applications 398
disadvantages 399
future use in industry 398
in chemical industry 399
in food and drink industry 399
in hydro-space vehicles 399
in ships 399
Fluidised-bed prototype boiler 622
Flutter and vibration, aircraft, by R. H. Scanlan and R. Rosenbaum (book) 504
Flying Scotsman locomotive, export tour 128, 154, 179, 227-59, 331. *Letter* 282
Flying spot telecine equipment 517-8
Foam plastic packaging 38
Fog lamps for motor cars 409
Fogarasy, A. A., dynamic analysis 194
Foil heating elements, design and applications 421
Folding machine, sheet-metal, Besco-Autofold 64
Besco-Trufold 65
Follenfant, H. G., railways *vs* roads 154
Food and drink industry, fluidics in 399
Foot, C. W., rolling bearing lubrication 63, 153
Football stand, heating of 535
Force measuring blocks 298
Ford Motor Co. Ltd., Capri motor car 418. *Letter* 3
conveyor monitor system 497
Escort motor car 653
turbine truck 355
Forecasting, technological, and corporate strategy, by G. Wills *et al.* (book) 324
by R. V. Arnfield (book) 400
Forges, foundry directory and register of (book) 146
Forging(s), precision, glass lubricant for 271
Vitkovice Steel 11
Form, laws of, by G. Spencer Brown (book) 324
Forming (book) 276
Forming machine, electro-spark 140
pipe-end 599
roll 65
Forming unit, fluid, Saab 115
Forticrete Ltd., modular concrete blocks 448
Fortran computer language 576
Foster, K., electromagnetic theory (book) 630
Fothergill & Harvey, carbon fibre reinforced plastics for loom 489
Foulness air/sea port scheme 566
Foundation Engineering Ltd., thrust-boring abutments 552. *Correction* 597
Foundry. *See* Casting; Moulding, etc.
Foundry directory and register of forges (book) 146
Foundry Equipment Ltd., pattern flow moulding unit 573
Fox armoured car 390
Fox, Samuel, & Co. Ltd., coil polishing line 90
Fracture, elasticity and flow, by J. C. Jaeger (book) 668
Frames, plastic design of, by Sir John Baker and J. Heyman (book) 324
Frankel, A., turbine generators 519
Fraser, Andrew, & Co. Ltd., directional control valves 661
Free-Flex frictionless pivot 115
Freeman Fox & Partners, Hong Kong harbour tunnel 2
Freeman Fox, Wilbur Smith & Associates, Hong Kong underground railway 104
Frequency and time analysis, Engineering Outline 605
Friction and surface finish (book) 198
Frigate, type 21, gas-turbine powered 415
Frisch pipe-end forming machines 599
Fuel, nuclear. *See* Nuclear fuel
see also under specific types of fuel
Fuel cell, normal temperature operation 486
Fuel injection, electronic, Brico 208
for motor cars 654
Triumph TR6 motor car 84
Fuel tanks, collapsible 181
Fuel technology, dictionary of, by A. Gilpin (book) 604
Fuji Iron & Steel Co. Ltd., continuous casting 191
Function costs analysis, Engineering Outline 529
Furnace, annealing, mesh-belt conveyor 216
blast. *See* Blast furnace
electric, roof rings 294
heat treatment, program control 41
Furniture industry, automation unit for 25, 36
Furniture Industry Research Association, automation unit 25, 36

G

Gabor, D., holography 424
Gaines, M. W., atomic energy (book) 452
Galaxy aircraft. *See* Lockheed
Gallay, Delaney, Ltd., press for fluid forming 115
Galvanizing, gas-fired bath 142
Galvanizing line for Finland 26
Garratt locomotive, by A. E. Durrant (book) 70
Garton, C. G., dielectric relaxation 325. *Correction* 330
rate processes 631
Gas(es), liquid, rail tanker for 459
natural. *See* Natural gas
see also under specific types of gas
Gas drilling rig. *See* Drilling rig
Gas-fired air conditioning 88
Gas firing for galvanizing bath 142
Gas igniter, Brush Clevite 342
Gas industry, amalgamation with electricity, proposal 151
Gas pipe, leak detection in 522
Gas supplies, domestic tariff trends 410
Gas turbine, Avon-powered 14
Ford truck 355
in frigate type-21 415
manufacturing agreement, GE-JBE 494
natural gas for 38
Rolls-Royce marine Proteus 335
Rolls-Royce Olympus TM3 415
Rolls-Royce Tyne 415
see also Aircraft engines
Gas-turbine generating sets, for Abu Dhabi 495
natural gas 140
Gascoyne, P. F., escalators 410. *Letter* 584
Gasholders repair with plastics 522
Gaster, K., information retrieval 50
Gazis, D. C., free vibrations of circular cylindrical shells (book) 276
Gear(s) and transmissions, by J. G. Giles (book) 120
composite structure 598
Gear-shaving machine 667
Gear wear, by spark discharge erosion 666
in printing machines 395. *Letter* 432
Gearbox, epicyclic, Andantex Ltd. 42
TN-15X, Self Changing Gears 265
Geary, P. J., photon detectors (book) 554
GEC-AEI (Electronics), Goonhilly aerials 164
GEC-Elliott-903 computer 545
GEC-Marconi Electronics Ltd., Goonhilly aerials 164
spacecraft division 210
Geco Manufacturing Co. Ltd., automatic sheet feeder 473
General Electric Co. (US), cryogenic underground cables 471
electric motor for high temperatures 572
industrial gas-turbines 494
General Electric Mark Century Model II numerical positioning control unit 347
General Motors Corp., automatic transmission 443
4-53T two-stroke diesel engine 265
motor car developments 211
General Motors Scotland Ltd., paint spraybooth 294
General Post Office. *See* Post Office
Generating sets, gas-turbine, natural gas 140
portable 310
Generator, drag cup induction two-phase 145
reduced-ripple dc 152. *Letters* 178, 282, 306
turbine (A. Frankel) 519
see also Alternator
Genesys structural engineering computer system 2
Geology for engineers, by J. Bundred (book) 604
'George the Fifth' class steam locomotive 543
German microelectronics data (book) 44
Giblin, R. A., junction diodes 505
Giddings & Lewis-Fraser Ltd., automatic assembly systems 219
European Machine Tool Exhibition 18
numerical control of machine tools 220
numerical control seminars 220
NumeriCenter machines 220
Gilchrist, A., information retrieval 50
Giles, J. G., gears and transmissions (book) 120
motor-vehicle equipment 374
Gillam, E., materials under stress (book) 172
Gilman-Fraser Ltd., assembly machines 420
Gilpin, A., fuel technology, dictionary of (book) 604
Gjorv, O. E., reinforced concrete wharves (book) 324
GKN Birfield Transmission Ltd., Hookes joint 43
GKN Machinery Ltd., billet inspection machine 323
furnace roof rings 294
Glacier-Herbert sterngear system 42
Glacier Metal Co. Ltd., rolling mill 270
Glass Federations, European, annual congress 407
Glass fibre, technical developments 407
Glass fibre materials, applications of 614
Glass industry, technical developments 407
Glass lubricant for precision forging 271
Glazing, double, and heating economics 462
Glued rail joint 263
Glynwed Screws & Fastenings Ltd., electronic counting 63
Godfrey, D. J., silicon nitride 126
Goldman, S., information theory (book) 300
Goldstone tracking station 137
Goodman, E. W., nuclear rocket 27
Goodwin, D. W., optical computer 423
Goonhilly satellite earth station 164
Gosling, W., dc generator 178. *Letter* 282
Gosman, A. D., *et al.*, heat and mass transfer in recirculating flows (book) 222
Governor, centrifugal 144
mechanical 144
Goymour, E. P., force measuring devices 298
GP Yak motor car 433
Graco of England Ltd., painting machine 193
Grainger, J. A., flow turning of metals (book) 120
Grampian Chemicals, oil storage depot at Nigg Point 292
refinery at Invergordon 292
Granada Television, colour television 515
Grand titration, by J. Needham (book) 348
Grantura Plastics Ltd., GP Yak motor car 433
Grass-cutting machine, hovercraft principle for 81
Gravel beds, braking effect of 355
Graviner (Colnbrook) Ltd., fire protection equipment 127
Gravity gradient experiment by satellite 188
Grease, rolling bearing lubrication 63
Greater London Council, dock redevelopment 590
Greene, A. B., testing of internal combustion engines (book) 504
Gribbon, H. D., history of water power in Ulster (book) 276
Grinding machine, automatic chucking 118
cam, numerical control 602
cylindrical, Churchill 119
Grinding mills, pneumatic tyre support and drive 367
Grinding wheel, Resimet 472
Group technology, economic and design considerations 446
Gulf Stream study by submersible *Ben Franklin* 31 181
Gun, high-velocity 30 mm, Rarden-30 390
Gunn effect oscillators, microwave, Engineering Outline 401
Gunson's Colorplugs Ltd., carburettor tuning device 33
Guntert and Zimmerman, slip-form paver 30
Guy Motors, 44 ton articulated motor vehicle 436

H

Hadsphaltic Construction Co. Ltd., thrust boring bridge process 553
Haigh, C. P., conference on thermal stresses 306
Hall & Kay Ltd., hot oil heating installation 445
Hall, M., scientists and engineers 177
Hall, P. G., airline location 357
Hallett, F. H., machine shop theory and practice (book) 276
Hamel, G. Wynn, *Flying Scotsman* locomotive 282
Hamilton, J. A. B., Britain's greatest rail disaster (book) 400
Hampson, M. B., silicone rubber 199
Hancock & Co. (Engineers) Ltd., Han-co-ordinate oxy-cutting machine 321

Handles, magnetic, for steel sheet. *Letters* 51, 307
Handley, W., industrial safety handbook (book) 630
Handling, pneumatic, of bulk materials, development laboratory 502
Hangar for London Airport 284
Hanstead, P. D., dc generator 178. *Letter* 282
Harbour, Hong Kong, tunnel under 2
Hardening, vertical traverse equipment 342
Hardy, N. E., silicon nitride. *Letter* 77
Haresnape, B., railway design since 1830 (book) 400
Harris, D. H., thick film ferrites 623
Harris, H. G., design bank 447
Harrison, H. L., automatic controls (book) 172
Harrison & Sons Ltd., stamp printing 257
Hartlepool nuclear power station 344
Hartnell governor 144
Hasler, H. G., floating breakwater 287
Hasselblad camera for Moon landing mission 58
Haut, F. J. G., history of electric locomotive (book) 198
Hawk profiling machine 322
Hawker Siddeley Aircraft Ltd., Nimrod reconnaissance aircraft 212
748 aircraft for Board of Trade 460
Hawker Siddeley Dynamics Ltd. 588
DCC-2 computer 577
Inpower clutches 42
World Weather Watch stations 263
Hawthorne, R. & W., beam engines 51
Hay & Smart (Projects) Ltd., articulated ship 127
ship coupling gear 35
Head Wrightson Machine Co. Ltd., galvanizing line for Finland 26
Health conditions in ceramic industry, by C. N. Davies (book) 578
Healy, R. J., emergency and disaster planning (book) 528
Heat, applied, by J-B Sneeden and S. V. Kerr (book) 374
fundamentals of, by J. R. Welty, *et al.* (book) 630
Heat recovery system for meter station 336
Heat transfer in recirculating flows, by A. D. Gosman *et al.* (book) 222
progress in (book) 554
Heat-transfer medium, Thermex 628
Heat treatment. *See* Quenching
Heat treatment furnace, program control 41
Heater, thermal fluid, Stone-Vapor 628
Thermobloc, for football stand 535
Heathcote and Coleman, vehicle wheels 406
Heathfield television mast 617
Heating, central, insulation and economics of 462. *Letters* 485, 534, 560, 610, 636
district, developments 8-9
Nottingham 9
domestic, by laminated foil 422
factory, comparative costs 14
hot oil installation 445
induction, laboratory, Westinghouse 140
of football stand 535
of meter station 336
road, for snow and ice control 465
vapour-phase, Thermex 628
Heating foil, design, construction and applications 421
Helicopter. *See* under Aircraft
Hemingway, E. W., thrust bearing 598
Henderson, G. P., current European directories (book) 452
Hepworth Electrical Developments Ltd., tracing underground cables 572
Hepworth Iron Co. (Engineering) Ltd., hydraulic pump 347
Hepworth-Polva Plastics Ltd., pipeline suspended from bridge 90
Herrmann, G., free vibrations of circular cylindrical shells (book) 276
Hewlett Packard, coaxial cable fault location 471
ten-figure slide rule 576
Heyman, J., plastic design of frames (book) 324
Heywood, R. B., photoelasticity for designers (book) 478
Hick Hargreaves & Co. Ltd., planing machine 347
Highway, Asian. *Letter* 3
see also Road
Hill, P. G., steam tables (book) 668
Hillman GT motor car 364-5
Hillman Imp motor car 653-4
by T. C. Millington (book) 426
Hilton, F., advanced carpentry and joinery (book) 578
Hinkley Point B nuclear power station 90
Hirschhorn, J., rotary engines, 458. *Letter* 560
History, of electric locomotive, by F. J. G. Haut (book) 198
of technology, bibliography of, by E. S. Ferguson (book) 198
of water power in Ulster, by H. D. Gribbon (book) 276
Hitachi Ltd., continuous casting 191
liquid-metal pumps 14
Hoare & Co., machine tool industry 101
Hoffmann, G., nuclear-powered airships 564
Hoffmann Manufacturing Co. Ltd., fatigue tests on bearing steels 94
rolling bearing lubrication 63. *Letters* 103, 153
Hoists, air-operated 68
Cosmopolitan passenger/materials 117
Holloware, aluminium-alloy, Porcelloy 541
Holm, B. E., how to manage your information (book) 400
Holmes, Charles D. and Co. Ltd., *C. S. Forrester* trawler 206
Holmstrom, J. E., telephones use at night 611. *Correction* 637
Holography, technique of 424
ultrasonic, Engineering Outline 71
Holroyd, P., engineering principles for electrical technicians (book) 554
Holtum, R. R., Lloyd's Register of Shipping 272
Home Oil of Canada, natural gas 433
Hondros, E. D., interfaces in solids 427
Honeywell '16' series computers 577
Honeywell Exec 16 DDC/DAS system 370
Honeywell H316 computer 371, 433
Hong Kong, harbour tunnel 2
underground railway 104
Hookes joint, GKN Birfield 43
Hopper, R., engineering drawing practice 103
Hornby, F., Meccano 657
Hosiery, Pretty Polly, manufacture of 242
Hosiery and Allied Trades Research Association, automation in clothing industry 592
Hotwork Development Ltd., gas burners 142
Houghton, B., standardization for documentation (book) 70
House insulation and heating economics 462
Household, H., Thames and Severn canal (book) 70
Hovanessian, S. A., matrix-computer methods (book) 222
Hovercraft, development review 245
HM2 sidewall 246
passenger services development 245
SR N1 245
SR N4 245, 381
SR N6 245
tracked, consultants' study 545
Hovercraft principle for grass-cutting machine 81
Hoverlloyd hovercraft services 245, 381
Hovermarine HM2 sidewall hovercraft 246
Hovertravel Ltd. 247
How Group Ltd., factory heating 14
Howard, John & Co. Ltd., Foulness scheme 566
railway traverser 217
Howell, J., magnetic lifting handles 307
Hoy Carbides Ltd., tool grade and speed selection 394
Hoyle, G., electro-slag refining (book) 604
Huco Engineering Industries Ltd., Series 35 couplings 547
Hughes, G. M., car testing 266
Hughes, W. J., traction engines worth modelling (book) 504
Hulten, P., machine (book) 44
Human Zoo, D. Morris 353
Hutchings, D., engineering science at the university (book) 478
Hutchins, W. J., translations 77
Hutchinson, Sir Kenneth, Clean Air Conference 464
Hydraulic control systems, by M. A. Aizerman (book) 44
Hydraulic copying, planing machine 347
Hydraulic models, Engineering Outline 375
Hydraulic press. *See* Press
Hydraulic pump. *See* Pump
Hydraulic remote indication and control 476
Hydraulics, coastal, by A. M. M. Wood (book) 426
Hydraulics Research Station, floating breakwater 287
oil pollution prevention 130
Hydroelectric power plants, Norway, by F. Vogt (book) 198
Hydrogen in metals, by J. P. Fidelle and M. Rapin (book) 668
Hydrogen tank fault, Apollo-12 546
Hydro-space vehicles, fluidics in 399
Hydrox Digester bacterial decomposition plant 570
Hy-mac excavator, design of 309
Hymatic Engineering Co. Ltd., Joule-Thomson coolers 497
pressurization system 419

I

Ibbotson, L., Southern Region in '70s 586
IBM magnetic card Selectric typewriter 444
IBM System-360 model-30 computer 272
IBM 360/65 computers for Lloyds Bank 255
Ice, road conditions in 465
Ice-breaker ship, *Lenin*, nuclear-propelled 536
Ice-breaker tanker, *Manhatten* 314
Ideal-Standard Ltd., Viscount boiler 345
Ignacz, P., silicone grease coating 91
Igniter, gas, Brush Clevite 342
Illumination. *See* Lamp; Light; Lighting
Imp motor car. *See* Hillman
Impact avalanche transit time (impatt) oscillator, Engineering Outline 506
Impact sled, non-destructive 619
Impatt oscillator. *See* Impact avalanche transit time
Imperial Chemical Industries Ltd., oil pollution prevention 131
paint shop at Ryton car factory 296
polypropylene foam mouldings 14
Thermex heat-transfer medium 628
Impregnated Diamond Products Ltd., Resimet grinding wheel 472
Incineration, by R. C. Corey (book) 578
Incinerator, for sewage sludge 360
refuse, rotary-stoked 293
Independent Television Authority, colour television services 511-18
Independent Television News, colour television 514
Indexing table for automatic assembly 420
Indexomatic automatic assembly machine 420
India, North Western Railway of (book) 172
Indication, remote, techniques for 476
Inductelec Ltd., hardening equipment 342
Induction heating. *See* Heating
Industrial archaeology of the Lake Counties, by M. Davies-Shiel and J. D. Marshall (book) 630
Industrial Architecture Award, *Financial Times* 609
Industrial Magnets Ltd., magnetic belt conveyors 38
Industrial project engineering 600
Industrial relations, by E. G. A. Armstrong (book) 300
Industrial safety handbook, by W. Handley (book) 630
Industrial Society, library. *Letter* 636
Industrial Training Act, conference on 405
Industry cooperation with schools 585
Inertia Switch Ltd., bore-inspection camera 587
Information, how to manage your, by B. E. Holm (book) 400
recording and storage, Lloyd's Register 272
Information retrieval, construction industry 50
Information theory, by S. Goldman (book) 300
in parcel sorting 343
Infra-red radiometer 137
Infra-red spectrometer 137
Ingam, K., Braille reproduction system 104
Ingenieur wrist watch 638
Inspection, automated (book) 504
Institution of Civil Engineers, conference on airports 356
contract forms (book) 222
film on work of engineers 635
'human story' plea 25
Institution of Electrical Engineers, conference on engineers that industry wants 177
Parsons Memorial Lecture, A. Frankel 519
Institution of Heating and Ventilation Engineers, gas-fired air-conditioning, Skerrett & Wright 88
Institution of Locomotive Engineers, amalgamation with IME 542
history of 542
locomotive design, W. G. F. Thorley 214
Institution of Mechanical Engineers, amalgamation of ILocoE with 542
symposium on freight wagons 440
Institution of Mining and Metallurgy, British mining fields (book) 120

Institution of Production Engineers, engineer's guide to costing (book) 120
Institution of Sales Engineers, salesmanship for sales engineers (book) 96
Instrument research, new. *Letters* 77, 103, 152
Insulating joints, assembled, Mapel 270
Insulation, dielectric properties of 572
house, and heating economics 462
in self-heating building 336
of containers 320
Insulators, power transmission line, flashover prevention 91
Integral transformations, generalized, by A. H. Zemanian (book) 70
Integrated circuit chips, bonding to substrate 19
Interfaces in solids, Engineering Outline 427
Intergovernmental Maritime Consultative Organization 483
Intermediate Technology Group Limited 163
Internal-combustion engine(s), research, Bath University 308
testing of, by A. B. Greene and G. G. Lucas (book) 504
International Apprenticeship Competition (Brussels) 151. *Letters* 282, 534, 584, 610
International Building Exhibition (Olympia) 520
International Computers Ltd., ICL 1901 computer 181
International cooperation, Sir George Edwards 329
International Development Association 162
International Freight Container and Container Handling Exhibition (Earls Court) 319
International Machine Tool Conference (Manchester) 329, 446
International Nickel Ltd., nickel supplies 523
SG iron 345
International Power Transmission Engineering Exhibition (London) 42
International Research and Development Co., Ltd., electro-chemical machining 270
superconducting motor 597
International Sheet Metal Exhibition (London) 64
International Telephone and Telegraph, computer booking for airlines 381
International Union of Railways 30
International Watch Co., Ingenieur wrist watch 638
Maiana wrist watch 637
International Welding and Cutting Fair (Essen) 321
Inventions, for manufacture under licence 598
sources of, by J. Jewkes, *et al.* (book) 668
Inventiveness and innovation symposium, BA 285
Invergordon, oil refinery 292
Ion-exchange resin regeneration columns 561
Iron, cast. *See* Cast Iron
molten, transfer trains 165
Wealden, by E. Straker (book) 20
Iron Fairy Cairngorm truck-mounted crane 450-1
Iron Fairy Tourmaline telescopic-jib crane 451
Iron Fairy Zircon truck-mounted crane 450
Iron-ore mine, Mount Whaleback 12. *Letter* 178
Iron ore mining, Mount Newman scheme 12
Iron and Steel Institute, organization of maintenance (book) 400
Iron and steel works of the world, by H. G. Cordero and R. Cordero (book) 96
Iron Works, Waterloo, by L. T. C. Rolt (book) 222
ISO limits and fits, BS 294
Isotopes and radiation in soil organic-matter studies (book) 324
Israel, industrial equipment requirements 76

J

Jack-knifing device. *See* Motor vehicle, articulated
Jackson, D., wonderful world of engineering (book) 668
Jaeger, J. C., elasticity, fracture and flow (book) 668
Jaeger, R. G., radiation shielding (book) 348
Jaguar Cars Ltd., model revisions 417
natural-gas conversion 191
XK petrol engine for Scorpion tank 265
Jane's all the world's aircraft, by J. W. R. Taylor (book) 554
Japan, continuous casting plant 191
motor-car component manufacture under licence 263
Jarrett, J. E. S., Asian highway 3
Jarvis, R. G., locomotive design 215
Jastrow, R., space programme 533
Jeffs, E. J., air traffic congestion 188
air traffic control 540
aircraft noise 108
airport development 356
Amsterdam World Trade Centre 412
Apollo 11 contamination control 79
Apollo 11 lunar mission 53
Apollo 12 lunar mission 487, 546
automated baggage handling 83
automatic landing systems 460
battery-driven vans 567
beer processing 240
Berkeley Nuclear Laboratories 107
bore-inspection cameras 587
British space research 210
C-5A Galaxy freighter aircraft dock 496
Do-it-yourself Exhibition 290
Foulness scheme 566
future Moon missions 132
gas and electricity supply tarriffs 410
gas-fired air conditioning 88
glass fibre materials 614
industrial gas-turbines 494
Lockheed TriStar airliner 160, 312
London Airport fire services 155
mains services trench 521
Mars, and outer planets 113, 136
Meccano 657
meter testing station 336
Motor Show 442
Mount Newman scheme 12. *Letter* 178
Niagara Falls 182
Nimrod reconnaissance aircraft 212
power distribution cost economies 310
power plant failures 616
power station fuel trends 622
precision forging 271
Queen Mary 268
Soyuz space programme 437
St Katharine Docks redevelopment 590
stamp printers 257
television mast 617
transmission line repairs 341
transmission lines over motorways 366
Trent river system 286
Trident 3B airliner 538
Vanguard Merchantman aircraft conversion 468
Woodhead tunnel cable circuits 470. *Letters* 510, 584
Jellett, J., 'human story' 25
Jenkinson, D., LMS coach 1923-1957 (book) 604
Jensen FF sports saloon motor car 654
Jensen, W. G., nuclear power (book) 20
Jesperson 12M system of industrial building 520
Jewkes, J., sources of invention (book) 668
Johnson, Sir Henry, BR management structure 635
Johnson, R. F., fatigue testing of bearing steels 94
Johnson, R. I., china clay residues 534
Joinery and carpentry, advanced, by F. Hilton (book) 578
Joints, expansion, in bridges and roads, by W. Köster (book) 146
Hookes, GKN Birfield 43
insulating, assembled, Mapel 270
rail, glued 263
Jones, D. S., introductory analysis (book) 604
Jones, K., hybrid computers 664
Jones, K. P., steam locomotive development (book) 198
Jones, M. J. B., guide to metrication (book) 374
Jones, S. W., design problems and their solutions (book) 348
Jones 1080 Series of mast cranes 451
Jordan, D. W., introductory analysis (book) 604
Joule-Thomson self-regulating coolers 497
Journal bearings in turbomachinery, by D. M. Smith (book) 604
Junction diodes as oscillators, Engineering Outline 505
Junction laser, Engineering Outline 508

K

Karant, M., airport design 356
Karmann-Ghia, Triumph TR6 motor car 84
Kaufman, M., history of pvc (book) 20
Keenan, J. H., steam tables (book) 668
Kenedi, R. M., forces generated at leg joints 308
'Kentigern', central heating 534. *Letter* 610
Kerb, safety design 611
Kerr, S. V., applied heat (book) 374
Kestin, J., thermodynamics (book) 44
Keyes, F. G., steam tables (book) 668
Khyber, couplings to, by P. S. A. Berridge (book) 172
Kiln, fast-firing electric, for Denby pottery 241
Kilogramme, new name proposals. *Letter* 610
see also Mass
Kinetics, reaction, elementary, by J. Latham (book) 630
King, Geo W. Ltd., pneumatic handling equipment 502
King, W. G., electrical, magnetic and visual methods of testing materials (book) 504
Kings Worthy link road, Winchester 180
Kingsbury, G. & Co. (Machine Tools) Ltd., lathe with adaptive control system 475
Kingsford, P. W., electrical engineers and workers (book) 400
Kingston Marine Technology Ltd., landing craft 284
Kitchen, computerized 433
K & L directional control valves 661
Kodak film for Moon landing mission 59
Koppy Tool Corp., energy-absorbing steering column 361
Korea Electric Co., power station 355
Köster, W., expansion joints in bridges and roads (book) 146
Kummer Freres, European Machine Tool Exhibition 17
Kurim milling machine 216

L

Labour Party, 50 years ago 1
Laing, John, Construction Ltd., hangar for London Airport 284
industrialized building 520
polystyrene block shuttering 191
Lake Counties, industrial archaeology of, by M. Davies-Shiel and J. D. Marshall (book) 630
Lake & Elliot, pattern flow moulding unit 573
Lakeside Galvanizing Co., gas firing 142
Lamination defects in steel plate 116. *Correction* 179
Lamp, fog, for motor cars 409
motor-car, developments 408
sealed-beam motor-car 409
tungsten-halogen 28, 408
Lanby light buoy 588
Landing craft, commercial development 284
Langton, N. H., space environment (book) 44
La Que, J., international standardization 2
Laser, junction, Engineering Outline 508
use in optical computer 423
Latham, J., elementary reaction kinetics (book) 630
Lathe, cam-profile turning 92
diamond tool 549
turret, automatic 40
vertical, Staveley two-axes 575
see also Automatic(s)
Laurence Scott and Electromotors Ltd., reluctance motors 627
La Voiture Electronique SA, Stil electric car 382
Law(s), engineering, and ICE contracts, by M. W. Abrahamson (book) 222
of form, by G. Spencer Brown (book) 324
Law, R., James Watt and the separate condenser (book) 146
Lawrence, Harry F., & Co., mobile cantilever bridge 366
Lawrence Radiation Laboratory, machine tool research 550
Lawrenson, P. J., reluctance motor 626
synchronous reluctance motor 285
Laxton Grammar School, cooperation with industry 585
Lead accumulator, by K. A. Dasoyan and I. A. Aguf (book) 426
Leak detection in gas pipe 522
Lee-Frampton, J. B., instrument research 77, 152. *Letters* 103, 152
lifting magnets 51. *Letter* 307
Legal aspects of metrication 102
Legal Units of Measurement, Advisory Committee on (ACLUM) 102
Lehane Mackenzie & Shand Ltd., pipeline 342
Lenin ice-breaker, nuclear-propelled 536
Lens(es), for colour television 518
welding helmets, etc. 322
Leonard tafting machine 346
'Leprechaun' hosiery, manufacture of 242
Le Schack, L. A., tracked vehicles 89

Letter sorting, automatic 259
Level control, continuous 419
Levelling line for aluminium strip 170
Levy, A., Bassett-Lowke (Railways) 252
Lewis, E. V., ships (book) 348
Leyland-Rover BS, motor car 106
Licence, inventions for manufacture under 598
Lichfield, refuse disposal 293
Lifting gear proof testers, Moore 547
Light, radiant, emission units 342
see also Lamp; Lighting
Light buoy, automatic 588
Light control of bar automatic 143
Lighting, by D. C. Pritchard (book) 668
film studio developments 110
stage, Royal Shakespeare Theatre 244
see also Lamp; Light
Lighting grid for film studios 110
Lightman, E., telephone circuits at night 611. *Correction* 637
Lightning, motor car protection against 207
Limits and fits, ISO, BS 294
Lincoln Electric Co. Ltd., Arcmaker Sprite welding machines 321
Lindholm, U. L., mechanical behaviour of materials under dynamic loads (book) 172
Lindop, T. W., silicon nitride 77. *Letter* 126
Linear motion, measurement of 145
Liner, *Queen Mary*, at marine recreation complex 268
colour print of 407
Linford, A., fluid seals 498
Liquid(s) and liquid mixtures, by J. S. Rowlinson (book) 96
Liquid mixtures and liquids, by J. S. Rowlinson (book) 96
Livesey & Henderson, railway traverser 217
Livesey, L. R., Apollo 11 lunar mission 53
automation in clothing industry 592
bank computing 255
Ben Franklin submersible 31
Birkenhead Mersey Tunnel approach scheme 82
British Railways 413
carbon fibres 488
cargo loader 385
china clay industry 438. *Letter* 534
chocolate centres moulding process 640
cigarette making machinery 642
cocoa bean processing 288
colour film processing 156
colour television 511
communications in 2020 434
copper replacement by aluminium 185
coupling ships at sea 35
deep-diving system 332
Dragon project 5
electron microscope 387
fender unit 10
fingerprint coding 358
flood protection 313
Flying Scotsman 128
furniture industry automation unit 36
Goonhilly satellite earth station 164
grass-cutting machine 80
hosiery manufacture 242
house insulation materials 462. *Letters* 485, 534, 560, 610, 636
IBM automatic typewriter 444
industrial design 309
Ingenieur watch 638
light buoy 588
long-life battery 359
marine research net control device 621
metals *v.* plastics. *Letter* 27
motor-vehicle lighting 408
non-destructive testing service 388
north-east Scotland developments 292
nuclear powered ships 536
oil pollution 130
paper-making machine 384
Pinewood film studios 109
Pisces submersible 6
pocket binocular 645
railway track 29
side-scan sonar 562
silicone rubber membranes 441
Southern Region in '70s 586
spacecraft control station 311
stern bearings 414
tanker *Manhattan* 314
Tenacity patrol boat 334
tobacco drying 644
type 21 frigate 415
washing machines 589
wheelchairs 363
Lloyd, B. E., Professional Engineers 152
Lloyds, car repair research 612
Lloyds Bank Ltd., computer installation 255
Lloyd's Register of Shipping, drilling rigs 111
information recording 272
LMS coach 1923-1957, by R. J. Essery and D. Jenkinson (book) 604
Loaders and assemblers, by D. W. Barron (book) 528
Load-Lok winch, railway cargo securing by 191
Lockheed, Antilok anti-jack-knife device for articulated vehicles 492
C-5A Galaxy freighter aircraft dock 496
TriStar airliner 160, 312
noise of 104
visual performance of astronauts 78
Lockyer, K. G., factory management (book) 20
Locomotive, detail design and auxiliary equipment 214
electric, history of, by F. J. G. Haut (book) 198
Garratt, by A. E. Durrant (book) 70
hand-brake mechanisms 215
safety measures in design 214
steam, 'Atlantic' class 543
design, by E. S. Cox (book) 96
development, by K. P. Jones (book) 198
Flying Scotsman export tour 128, 154, 179, 227-59, 331. *Letter* 282
'George the Fifth' class 543
historical review 542
model makers 252
superheating development 542
underground electric haulage, by L. Szklarski *et al.* (book) 172
Loewy Robertson, rolling mill 270
Logicon Ltd., covered berth 396
London, City of, north bank scheme 26
underground railways. *See* London Transport
see also Greater London Council
London Airport, BAC 1-11 boarding procedure 308
butane-fired boiler 115
fire services 155
Foulness scheme 566
hangar for 284
runway grooving 572
London Docks, redevelopment scheme 590
London Metal Warehouses, materials stockholders 497
London Transport, accident at Neasden 637
strike of maintenance workers 559
Victoria line 154, 528
London Weekend Television, colour television 515
Longbottom, E., medium girder bridge 138
Longines, piezo-electric wrist watch 207
Loom, carbon fibre reinforced plastic strips increase speed 488
Lore, G. I. R., mysteries of the skies (book) 426
Lorry. *See* Motor vehicle
Lotus + 2 'S' motor car 655
Lotus Europa motor car 105, 106
Lotus type 63 motor car 135
Loughborough Consultants Ltd. 26
Loughborough University of Technology, consultancy service 26
Loveridge, D. J., data logging 273
Lowe, C. W., critical path analysis by bar chart (book) 578
Lubricant, glass, for precision forging 271
Lubricating oil. *See* Lubricant; Oil
Lubricating oil plant, Stanlow Refinery 32
Lubrication, of bearings in diesel engines 189
of rolling bearings 63. *Letters* 103, 153
of winch 445
Lucas Autosensa projector 409
Lucas Furnace Development, sewage sludge incineration 360
Lucas, G. G., testing of internal combustion engines (book) 504
Lucas Kienzle Instruments Ltd., tachographs 486
Lumped masses, dynamical equivalence of 194
Luna 15 spacecraft 78
Lunar missions. *See* Apollo; Moon landing
Lytollis, J., optical communication systems 277

M

Mac. *See* Mc
Machine, by P. Hulten (book) 44
Machine shop theory and practice, by F. H. Hallett (book) 276
Machine tool(s), adaptive control systems for 474
European Exhibition (Paris) 17
numerical control. *See* Numerical control
NumeriCenter 220
sequence control 41
System 24, Molins 140
Machine Tool Conference, International (Manchester) 329, 446
Machine tool industry, outlook 101, 102
statistics 101, 102
Machine Tool Industry Research Association, SI unit demonstration rig 294
Machine tool technical criteria 447
Machining, adaptive control systems 474
chemical, equipment 64
electro-chemical, ac operation 270
electro-erosion, conference on, Wickman 63
speed selection aid for 394
Machining centre, four-axes, numercial control 597
Staveley Moduleplan 574, 597
Maddock, I., inventiveness symposium 285
Magnesium-alloy motor-car wheels 158. *Letter* 406
Magnesium Industry Council, vehicle wheels 406
Magnetic belt conveyor for can handling 38
Magnetic chuck, bandsaw with 270
Magnetic drive in speed control 144
Magnetic fields, megagauss, Engineering Outline 453
Magnetic handles for steel sheet. *Letters* 51, 307
Magnetic methods of testing materials, by J. Blitz, *et al.* (book) 504
Magnetic tape, program control using 41
Magslip remote indication and control systems 477
Mahoney, J. H., air freight 357
Maiana wrist watch 637
Mains services, common trench for 521
Maintenance, building, profitable (book) 324
organization of (book) 400
Maintenance workers, strike of, LTE 559
Mamba pipe welding machine, BOC 322
MAN, natural-gas gas turbine 38
Man and the computer, by J. Diebold (book) 578
Management, factory, by K. G. Lockyer (book) 20
production, modern, by E. S. Buffa (book) 20
project, UMIST study 102
Management Consulting Services Bureau 458
Management techniques, by J. Argenti (book) 452
Manchester, airport planning report 78
Manchester University Institute of Science and Technology, project management 102
Manhatten, tanker icebreaker 314
Manson, J. B., Channel Tunnel 204
Manufacture under licence, inventions for 598
Manufacturing, materials and processes in, by E. P. De Garmo (book) 146
Manufacturing method, parts family 447
Manufacturing systems concepts, E. Merchant 446
J. Peklenik 446
Mapel assembled insulating joints 270
Marbaix, Gaston E., European Machine Tool Exhibition 17
Marconi Co. Ltd., communication satellite earth stations 270
computer control for buses 433
Goonhilly aerials 164
hologram system 424
Myriad II computer 433
Marine aggregate, handling plant 663
Marine research, net control device for 621
Marine technology, committee report on 609
Mariner spacecraft experiments 136
Maritime Consultative Organization, Intergovernmental 483
Marketing, for developing company, by J. Winkler (book) 222
in construction industry 520
Marples Ridgeway, Mersey Tunnel approach 82
Mars, landing proposal 181
space exploration findings 136
space exploration prospects 113
Marshall, J. D., industrial archaeology of the Lake Counties (book) 630
Martin-Black, J. B., Transport Museum 306
Mason, R., gas/electricity amalgamation 151
Mass, unit of. *Letters* 51, 204, 534, 584
see also kilogramme
Mass transfer, fundamentals of, by J. R. Welty, *et al.* (book) 630
in recirculating flows, by A. D. Gosman *et al.* (book) 222

progress in (book) 554
Massey, B. & S. Ltd., press brake 65
Mastertape (Magnetic) Ltd., diamond tool turning 551
Materials, advanced, by C. Z. Carroll-Porczynski (book) 120
and processes in manufacturing, by E. P. De Garmo (book) 146
bulk, pneumatic handling of, development laboratory 502
strength of, by G. H. Ryder (book) 528
testing, electrical, magnetic and visual methods of, by J. Blitz, *et al.* (book) 504
under dynamic loads, mechanical behaviour of, by U. L. Lindholm (book) 172
under stress, by E. Gillam (book) 172
Materials science, by B. R. Schlenker (book) 426
Materials stockholders, Metal Centres Ltd. 497
Mathematics, advanced, for science, by W. L. Ferrar (book) 426
by D. Bergamini (book) 348
Mather & Platt Ltd., onion peeling machine 585
stator-case castings 419
Mathieson, J. D., differentials 330
Matra, four-wheel drive 134
Matrix analysis of discontinuous control systems, by P. V. Bromberg (book) 172
Matrix-computer methods, by L. A. Pipes and S. A. Hovanessian (book) 222
Matyas, J., optimal control systems (book) 70
Maunder, L., dynamic analysis 194
Maxaret, anti-jack-knife device for articulated vehicles, Dunlop 459, 492
Maxi, Austin. *See* Austin Maxi
Mayer, E., mechanical seals (book) 300
Mayfran Inc., swarf recovery plant 572
Mazda, Wankel rotary engine 190
McAllan, J. D., composite gears 598
McAlpine, Sir Alfred, and Leonard Fairclough consortium, Bidston Moss viaduct 167
McConkey, A., applied thermodynamics (book) 668
McGregor, Robert, & Sons Ltd., slip paver 297
McKinsey & Co. Inc., BR management structure 635
McNamara, R. S., World Bank 329
McTaggart, M. H., pulsed neutron techniques 301
Mc *see also* Mac
Mear, M. H., & Co., metric conversion calculators 661
Mears Bros (Contractors) Ltd., Rockbreaker machine 318
Measurements, basic concepts of, by B. Ellis (book) 70
Legal Units of, Advisory Committee on (ACLUM) 102
Meat cans, metal detection in 388
Meccano constructional toy kits 657
Mechanical behaviour of materials under dynamic loads, by U. L. Lindholm (book) 172
Mechanical engineering in radar and communications, by C. J. Richards (book) 222
Mechanical Handling Engineers' Association, trade statistics 294
Mechanical handling equipment, cost statistics 294
Mechanical remote control systems 476
Mechanics, engineering, of deformable bodies, by E. F. Byars and R. D. Snyder (book) 504
of engineering soils, by P. L. Capper and W. F. Cassie (book) 120
Mecotron Europe (Malta) Ltd., BT differential 133
Megagauss magnetic fields, Engineering Outline 453
Mellotronics, programme-effects generator 519
Melrose, D., silicone rubber membranes 441
Mensforth, Sir Eric, inventiveness symposium 285
Mercedes-Benz, mid-engined motor car 106
Wankel powered sports car 180
Wankel rotary engine 190
Merchant, E., manufacturing systems concepts 446
Merchant ships, nuclear propulsion of 536
Merchantman aircraft. *See* Vanguard
Merrill, E., transport museum 262. *Letter* 306
Mersey Tunnel, Birkenhead approach scheme 82
feeder road system 167
Metal(s), hydrogen in, by J. P. Fidelle and M. Rapin (book) 668
recovery from refuse 52
v. plastics. *Letter* 27
Metal Centres Ltd., materials stockholders 497
Metal cutting process, adaptive control systems 474
Metal detection in meat cans 388
Metal part insertion in plastic matrix 373
Metal & Pipeline Endurance Ltd., assembled insulating joints 270
Metal research, by R. F. Bunshah (book) 348
Metalock (Britain) Ltd., colour print of *Queen Mary* liner 407
Metcalfe, J. E., British mining fields (book) 120
Metcalfe, T. J., weighing machines (book) 120
Metco Ltd., flame-sprayed nickel coatings 623
Meter testing station, NEEB 336
Metric conversion calculators 661
Metric converter, Wavin Pipes 497
Metric steel rules 216
Metrication, abbreviations. *Letter* 51
defence equipment 26
for time, proposal 15
guide to, by M. J. B. Jones (book) 374
in systems building 166
legislation changes 102
nameplates 484
US interest in 2
Meyor, K., bucketwheel excavators 178
Mez electric motors 11
Micaceous residue disposal, china clay industry 438
Microcircuits, thick film, high-speed printing 445
Microelectronics data, German (book) 44
Micron Sprayers Ltd., crop spraying 86
Microscope, electron, AEI 1 MV type EM7 387
Microwave Gunn effect oscillators, Engineering Outline 401
Microwave preheater for rubber products 367
Microwelding. *See* under Welding
Middle, G., group technology 446
Middleton Railway, preservation appeal 178
Midland Cylinder Rebores, conversions for disabled 207
Military Engineering Experimental Establishment, medium girder bridge (MGB) 138
Millard, R., public cleansing (book) 528
Miller, D. W., locomotive design 214
Miller, G. A., Alcan Porcelloy 584. *Letter* 636
Milling machine, Kurim FC36V 216
Staveley two-axes profile 575
Milling spindle system, adaptive control, Bunker-Ramo 475
Millington, T. C., Hillman Imps (book) 426
Milroy, V. E. J., prompt payment plan 406
Mimic diagram, remote control systems 477
Mine, iron-ore, Mount Whaleback 12. *Letter* 178
Mini Clubman motor car 417
Mini motor car 653
new versions 417
Mining, Cornish, by R. Burt (book) 374
iron ore, Mount Newman scheme 12
Mining fields, British, by J. E. Metcalfe (book) 120
Ministry of. *See* Education; Health; Technology, etc.
Minni-Die (Sales), punch and die-set tooling 65
Mint. *See* Royal Mint
Mirror systems for optical computers 423
Mitsui-C Itoh Pty Ltd., Mount Newman scheme 13
Mixing valve for shower booth 309
Mocon concrete-handling conveyor 117
Model(s), hydraulic, Engineering Outline 375
Modelling, traction engines worth, by W. J. Hughes (book) 504
Modular design, Engineering Outlines 21
Moiré fringes in strain analysis, by P. S. Theocaris (book) 172
Molins Machine Co., Mk 9 cigarette making machinery 642
System 24 machines 140
Momentum, fundamentals of, by J. R. Welty, *et al.* (book) 630
Monsanto Chemicals Ltd., Jablite expanded polystyrene 191
thick film ferrites 623
Montague, D. E., Ford Capri motor car 3
Montanus, N. R., airport congestion 356
Moon landing, comment on 49, 53, 75
contamination control 79
descent and take-off 54
future missions 60, 132
preparatory missions 56
scientific experiments 62
television and photographic equipment 58
vehicle developments 60
see also Apollo
Moore, J. G., steam tables (book) 668
Moore, P., 1970 yearbook of astronomy (book) 452
Moore, W. & E., Ltd., lifting gear proof testers 547
Morgan Crucible, carbon fibre reinforced plastics for loom 489
Morgan, E., non-destructive testing laboratory 388
Morgan, R. W., engineering graduates survey 392
Morris, D., *Human Zoo* 353
Morris motor car, 1800S 284
model revisions 417
Mortimer, J., APT project 282. *Letter* 330
Motor car, Aston Martin DB6 Mk.-2 208
Aston Martin DBS V8 383
Aston Martin model revisions 418
Austin, model revisions 417
Austin 1300 GT 364
Austin 1800S 284, 364
Austin Maxi 316, 318
automatic transmission in 443
Auto Union 100 LS 284
BMW, for UK 206
British Leyland design trends 653
Cadillac Fleetwood Eldorado 211
Citroen DS21 382
Citroen ID 20 Confort 186
Cosworth-Ford Formula-1 135
Daimler Sovereign 381, 417
Datsun-1000 568
design trends 1959-69 653
Dodge Challenger 206
drinks heater/cooler for 4
electric 654
Stil 382
experimental route guidance 308
Ferguson-P99 134
Fiat, Motor Show exhibits 418
Fiat-128 418, 443
Ford Capri 418. *Letter* 3
Ford Escort 653
four-wheel drive 134
fuel injection 208, 654
GP Yak 433
Hillman GT 364-5
Hillman Imp 426, 653-4
Jaguar, model revisions 417
Jensen FF sports saloon 654
Leyland-Rover BS 106
lightning protection 207
Lotus + 2 'S' 655
Lotus Europa 105, 106
Lotus type-63 135
Mercedes-Benz mid-engined 106
Mercedes-Benz sports, Wankel engine 180
mid-engined 105. *Letter* 153
Mini, new versions 417
Mini Clubman 417
Morris, model revisions 417
Morris 1800S 284
new models 381
prospects 637
Peugeot-304 382
plastics use in 211
Pontiac GTO coupé 211
power trends in 364
racing, fire protection equipment 127
four wheel drive 134
Reliant Scimitar GTE 381, 466
Renault, Motor Show exhibits 418
Renault-10 284
Renault-12 339, 382
Rolls-Royce Silver Shadow 418
Rootes Group Motor Show exhibits 418
safety airbag 28
safety regulations 296
Skoda developments 11
Standard-Triumph sports range 263
Sunbeam Alpine 381
three-wheeler, conversions for disabled 207
Triumph, model revisions 417
Triumph TR5PI 654
Triumph TR6 84
Unipower mid-engined 105
(up to 1930), by P. Sumner (book) 198
Vauxhall, model revisions 418
Vauxhall Viva 653
Vauxhall VX4/90 364-5
Volkswagen-181 383
Volkswagen servicing system 459
Volvo 1800S coupé 382
Wolseley-1885 443
Wolseley 18/85 Mark 2 284, 364
see also Motor vehicle
Motor-car components, licence manufacture in Japan 263
Motor-car engine, design trends 189

petrol, Jaguar XK, for Scorpion tank 265
piston attitude in 189
Wankel rotary piston 654
see also Rotary engine
Motor-car engine tester, electronic 613
Motor-car exhaust, atmosphere pollution 127
Motor-car interior trim, synthetic materials 407
Motor-car lamp developments 408
Motor-car production, Ryton factory 295
Motor-car proving ground, Vauxhall 184, 619
Motor-car quality and reliability 416. *Letter* 484
Motor-car repair research centre 612
Motor-car suspension, dynamic test equipment 591
Motor-car testing, *Which?* 266
Motor-car wheels, design trends 158. *Letter* 406
Motor cycle, accidents 28
anti-locking brakes 28
BSA Rocket 3 237
Triumph Trident 237
Motor racing, British racing green, by A. Pritchard (book) 96
Motor Show (Earls Court) 417, 442
(Paris) 382
Motor tricycle, design speculations 104
Motor vehicle(s), articulated, AEC Mammoth Major 436
anti-jack-knife device 459, 492
ERF 44 ton 436
44 ton models 436
Guy Motors 44 ton 436
battery-driven vans, GPO 567
battery-powered, Wessex Industries 624
Commercial Motor Show (Earls Court) 355
for rough terrain 89
Fox armoured car 390
gas turbine, Ford truck 355
patrol car, Puch-Haflinger 309
tachograph for 486
tracked, for rough terrain 89
see also Motor car
Motor-vehicle equipment, by J. G. Giles (book) 374
Motor-vehicle steering system, crack testing 389
Motorways, power transmission lines over 366
Ringway 2, for south of Thames 78
Mott, Hay & Anderson, Mersey tunnel 167
Mottu, A., machine tool technical criteria 447
Moulding, pattern flow unit 573
polypropylene foams, ICI 14
shell, of stator-case castings 419
Moulding machine for concrete blocks 448-9
Mount Newman mining scheme 12
Mount Whaleback iron-ore mine 12. *Letter* 178
Mower. *See* Grass-cutting machine
M'Pherson, P. K., City University 547
Mullard Ltd., electronic washing machines 589
semiconductor production 368
Munro, W. L. A., unit of mass 204. *Letter* 610
Museum, Birmingham, of Science and Industry 102
transport (Clapham and York) 125, 154. *Letters* 262, 306
Myers, F. H. E., SI units and time 50. *Letter* 126
Mysteries of the skies, by G. I. R. Lore and H. H. Deneeut (book) 426

N

Nahi, N. E., estimation theory and applications (book) 478
Nameplates, metrication 484
Nassau Smelting & Refining Co., pure lead battery 359
National Cash Register Co. Ltd., Nozljector emulsion machine 318
National Economic Development Office, civil engineering industry tax system 76
National Engineering Laboratory, numerical-control programming systems 192
National Institute of Oceanography, net control device 621
sonar for sea-bed mapping 561, 562
National Lock Co. of America, thread-forming screw 216
National Physical Laboratory 298
National Research Development Corp., dam design 313
deep diving system 332
floating breakwater 287
inventions for manufacture under licence 598
landing craft 284
sewage sludge incineration 360
National Society for Clean Air 464
Natural gas, conversion at Jaguar Cars 191
domestic conversion to 410
for gas turbine 38
from Yorkshire Moors 433
gas-turbine generating sets 140
storage plant 433
Needham, J., grand titration (book) 348
Neill, James, and Co. (Sheffield) Ltd., magnetic chuck 270
Neiman-Marcus, computerized kitchen 433
Nelson, S. E., SI units 153
Nerva XE nuclear rocket motor. *Letter* 27
Net control device for marine research 621
Netherlands Railways, glued rail joint 263
Neumann drinks heater/cooler for motor cars 4
Neutron. *See* Pulsed neutron techniques
Neutron radiography service, AERE 342
New Conveyor Co. Ltd., pneumatic handling equipment 502
New Zealand, river control and drainage in, by A. R. Acheson (book) 276
Newcomb, T. P., automobile brakes and braking systems (book) 578
Newington Trawlers Ltd., *C. S. Forrester* trawler 206
Niagara Falls, erosion and preservation plans 182
Nickel, supply shortages and alternatives for 523
Nickel coatings, flame-spraying 623
Nickols Automatics (EMI) Ltd., European Machine Tool Exhibition 17
Nigg Point, oil storage depot 292
Nimrod marine reconnaissance aircraft 212
Nishizaka, S., parts family manufacturing method 447
Nitomin Z epoxy plastic 522
Nixon, F., quality and reliability. *Letter* 484
Noble, C. F., design and production optimization 446. *Correction* 661
Nock, O. S., *Flying Scotsman* locomotive 235
railway signalling (book) 146
steam locomotives 542
Noise, aircraft, action against 108
diesel engine 189
Non-destructive testing, by H. B. Egerton (book) 172, 452
Non-destructive Testing Centre, neutron radiography service 342
Non-destructive testing service 388
Noone, M., pressure vessel committee 583
North Eastern Electricity Board, meter testing station 336
North Western Electricity Board, power distribution cost economies 310
North Western Railway of India (book) 172
Norton, W. E., Machine Tools Ltd., cam-grinding machine 602
Norway, hydroelectric power plants, by F. Vogt (book) 198
women engineers 380. *Letter* 432
Nottingham, district heating scheme 9
Nozljector machine for emulsion production 318
NSU, Wankel rotary engine 190
Nuclear energy, by M. W. Gaines (book) 452
Nuclear fuel(s), ceramic, Sol-gel processes for (book) 70
Nuclear fuel element, cleaning 433
performance testing 107
Nuclear Laboratories, Berkeley 107
Nuclear power, by W. G. Jensen (book) 20
Nuclear power stations 5
coal-firing *v.* 622
Dungeness 38
Hartlepool 344
Hinkley Point B 90
Nuclear propulsion, of airships 564
of container ships 536
of ice-breaker 536
of merchant ships 536
of tankers 536
Nuclear radiation shielding, by R. G. Jaeger, *et al.* (book) 348
Nuclear reactor, advanced and high-temperature gas-cooled (book) 374
advanced gas-cooled, temperature conditions 107
BPWR 537
Dragon project 5
fast breeder, Japan 14
small and medium-size power (book) 604
zero-energy graphite 107
Nuclear Rocket Development Station, engine tests 407
Nuclear rocket engine, XE 407
Nuclear rocket motor, Nerva XE. *Letter* 27
Numerical control, cam-grinding machine 602
industrial reorganisation 635
of machining centre 597
planing machine 347
programming systems 192
seminars on, Giddings & Lewis-Fraser 220
NumeriCenter machine tools 220
Nu-way burners 115, 345
Nylon for motor-car interior trim 407

O

Oakhanger, telemetry and command station 311
O'Brien, R., ships (book) 348
Odense Staalskibsvaerft AS, tanker boilers 38
Office landscaping, by F. Duffy and A. Wankum (book) 198
Ogorkiewicz, R. M., aluminium armoured car 390
aluminium tank 264
Oil Absorbing Booms Ltd., oil pollution prevention 130
Oil dispersant BP1100 433
Oil drilling explorations, Alaska 249-51
BP 249
Oil drilling platforms and rigs. *See* Drilling platforms and rigs
Oil engine. *See* Diesel engine
Oil exploration, sea-bed 594
Oil pollution. *See* Pollution
Oil storage depot, Nigg Point 292
Oldroyd, P. W. J., optical illusion 485. *Letters* 510, 584
Oliver, E., security manual (book) 426
Oliver, G. B. M., Professional Engineers 204
Olympus gas turbine. *See* Rolls-Royce
Onion peeling machine 585
Optical communication systems, Engineering Outline 277
Optical computer, advantages of 423
prospects of 423
Optical illusion on escalators 485. *Letter* 510
Optical methods of speed measurement 145
Optics, fibre, in communications 434
Optimal control systems, by J. Matyas (book) 70
Optimization in design and production processes 446
Organization of maintenance (book) 400
Organochlorine pesticides, control measures 87
Osborne, J. A., central heating 560. *Letter* 636
Oscillators, junction diodes as, Engineering Outline 505
microwave Gunn effect, Engineering Outline 401
Osgerby, C., fatigue testing machine 66
OTE/Galileo Micro digital readout 17
Oundle School, cooperation with industry 585
Ovens and paint spray booths 613
Overseas aid, cost-benefit consciousness 162
Overseas Containers Ltd., Far East service via Southampton 519
Overseas Development, Ministry of 163
Overseas Project Group 163
Oxygen, loss from atmosphere 610
Oyevaar, Stolle and Van Gool, Amsterdam World Trade Centre 412

P

Package cushioning, corner blocks for 445
Packaging, foam plastic 38
Paint shop, Ryton car factory 295
Paint spray booths, and ovens 613
for earth-moving equipment 294
Ryton car factory 295
Paint spraying machine, automatic 318
Painting machine, program-controlled 193
Painting plant for small components 394
Pako Corp., automatic film processor 389
Pakord Ltd., Load-Lok winch 191
Palgrave, D. A., unit of mass 584
Palmer Aero Products Ltd., de-icing equipment 104
Palmer, G. B., metals *v.* plastics 27
Pandrol clip for railway track 29
Panels, structural sandwich, analysis and design of, by H. G. Allen (book) 324
Pantin, W. & C. Ltd., truck conveyor 165
Paper cutting and collating machines, Reamaster 662

Paper-making machine, Verti-Forma 384
Paralysed persons, writing and reading aids 535
Parcel sorting, information theory in 343
Pargeter, L. J., translations 77
Paris Motor Show 382
Parkinson, D. H., megagauss magnetic fields 453
Parsons, Brincherhoff, Quade and Douglas, Hong Kong harbour tunnel 2
Parsons, L. A., onion peeling machine 585
Parthia, cargo ship 239
Parts family manufacturing methods 447
Patrol boat, *Tenacity*, Vosper-Thorneycroft 334
Patrol car, Puch-Haflinger 700 AP 309
Pattern flow moulding unit 573
Paul Y Construction, Hong Kong harbour tunnel 2
Payment, plan for prompt 406
Pegler, A., *Flying Scotsman* locomotive 179, 227-8, 331. *See also* under Flying Scotsman
Pegler-Hattersley Group, valve makers 256
Peklenik, J., manufacturing system concept development and integration 446
Pemberton, A. W., parcel sorting 343
Penfold, C. B., dc generator 282
Pennsalt Ltd., Nozljector emulsion machine 318
Pentagone-81 drilling rig 111
Perkins Engine Group, schools cooperation scheme 585
Permali Ltd., glued rail joint 263
Perry, M. A., frequency and time analysis 605
Peschke Pekazett, three-wheeled tractor 89
Pesticides, organochlorine, control measures 87
Petrol engine. *See* Engine; Motor-car engine
Petters/Brush Electrical diesel-alternator sets 588
Peugot-304 motor car 382
Phillips, N. R., dc generator 152, 282, 306. *Letters* 178, 282, 306
Photoelasticity for designers, by R. B. Heywood (book) 478
Photoelectric control of bar automatic 143
Photographic equipment, Apollo 11 lunar mission 58
Photographic film, for moon landing mission 59
Photogravure printing process 257
Photon detectors, by P. J. Geary and R. G. Burrows (book) 554
Pickford, J., analysis of surge (book) 528
Piezo-electric wrist watch 207
Pilbara Iron Ltd., Mount Newman scheme 13
Pile(s), bored, for Mersey Tunnel feeder road system 167
Pilkington, A., inventiveness symposium 285
Pillar Ltd., materials stockholders 497
Pipe, alkathene, for water supply 165
gas, leak detection in 522
see also Tube
Pipe-end forming machines 599
Pipe-smokers, design for 181. *Letter* 283
Pipe tafting machine 346
Pipe welding machine, Mamda, BOC 322
Pipelaying by auger boring machine 165
Pipeline, china clay residue disposal 438
Fawley-West London, Esso 342
sewage, suspended from bridge 90
Pipes, L. A. matrix-computer methods (book) 222
Pirelli Construction Co., Woodhead tunnel cable circuit 470
Pirelli General, cable drum handling trailer 419
Pisces submersible for underwater work 6
Piston attitude in motor-car engine 189
Pivot, frictionless, Free-Flex 115
Planets, outer, space exploration prospects 113
Planing machine, numerical control and hydraulic copying 347
Plastic design of frames, by Sir John Baker and J. Heyman (book) 324
Plastic materials, by J. A. Brydson (book) 504
Plastic matrix, metal part insertion in 373
Plastic packaging, foam 38
Plastic verge posts 154
Plasticity, engineering, by C. R. Calladine (book) 426
Plastics, carbon fibre reinforced, for loom 488
epoxy, Nitomin Z 522
in motor-car construction 211
reinforced, accelerated curing 421
v. metals. *Letter* 27
see also Thermoplastics
Plate, steel, lamination defects in 116. *Correction* 179
Platform trucks, battery-electric 624
Platon, G. A. Ltd., taper-tube flowmeter 141
Player, John, & Sons, gas-turbine generators 140
Plessey Co. Ltd., European Machine Tool Exhibition 17
hologram system 424
Plessey Electronics Group, numerical control system 597
Plessey Numerical Controls Ltd., formation and activities 635
Plywood laminate containers 320
Pneumatic control systems, by M. A. Aizerman (book) 44
Pneumatic handling of bulk materials, development laboratory 502
Pneumatic remote indication and control 476
Polak, P., automobile engine design 189
Polishing line for stainless steel strip 90
Pollock, J. M., unjustified leaders 510
Pollution, atmospheric, from motor-car exhaust 127
industrial, costs and investments 127
see also Clean Air
oil, controls proposals 483
dispersant for 433
methods of combating 130
Torrey Canyon tanker 130
river, china clay residues 438
new regulations 570
River Trent 286
sea, comment on 609
water. *See* Water pollution
Polyolefine balls, Allplas, for fire-fighting 127
Polypropylene foam mouldings, ICI 14
Polystyrene blocks as concrete shuttering 191
Polyvinyl chloride, history of, by M. Kaufman (book) 20
Pontiac GTO coupé motor car 211
Porcelain enamel for aluminium-alloy holloware 541
Porcelloy aluminium-alloy holloware 541. *Letter* 584
Porges, G., SI units. *Letter* 3
Porsche-Volkswagen sports cars 105
Portabatcha concrete mixing plant 503
Portasilo Ltd., concrete mixing plant 503
Porter, G., time machine 535
Positioner, universal, with vertical table adjustment 216
Post Office, battery-driven vans 567
pulse-code modulation in telephones 381
trading results and prospects 308
Postage stamps, printing process 257
Postal code, use in letter sorting 259
Potato and Allied Services, water purification plant 620
Potato harvester, electronic 459
Potato products, effluent process plant 620
Potter Rax Ltd., door for covered berth 397
Pottery, Denby, fast-firing kiln for 241
Powell, P. C., thermoplastics design data 173
Power distribution cost economies, NORWEB 310
Power plant. *See also* Power station
Power station, Aberthaw B, plant failures 616
Canary Islands 181
coal-firing *v.* nuclear 622
Eggborough, plant failures 616
equipment specifications 310
Fawley, superconducting motor 597
hydroelectric. *See* Hydroelectric power scheme
new sites authorised 509
nuclear. *See* Nuclear power station
South Korea 355
thermal efficiences 154
Tilbury B 38
Power system economics, by E. O. Penshaw Taylor and G. A. Boal (book) 630
Power system protection (book) 348
Power transmission. *See* Drive; Gear; Transmission
Power Transmission Engineering Exhibition, International (London) 42
Power transmission lines, flashover prevention 91
over motorways 366
overhead, live repairs to 341
Woodhead tunnel, installation 470
see also Cable(s)
Preheater, microwave, for rubber products 367
Press, for fluid forming 115
horizontal hydraulic 216
power, Balconi 65
Press brake, hydro-mechanical 65
Press, William, & Son Ltd., assembled insulating joints 270
lubrication of winch 445
Pressure, SI units of. *Letter* 153
Pressure Vessels Authority, conference (Manchester) 262, 583. *Letters* 306, 636
Pressure vessels industry, national authority need 583
Pressurization system, radar waveguide 419
Pretty Polly hosiery, manufacture of 242
Price structure for heavy electrical plant 509
Pricerite, computer systems 181
Printed armature electric motor 196
Printed circuit(s), thick film microcircuits 445
Printed circuit boards, B Neg technique 597
production line testing 522
Printed Motors Ltd., printed armature motor 196
Printing, photogravure process 257
postage stamp processes 257
recess, of postage stamps 258
Printing machines, gear wear 395. *Letters* 432
Pritchard, A., British racing green (book) 96
Pritchard, D. C., lighting (book) 668
Probability approach to budgets 50
Probert, S. D., dc generator 152, 282, 306. *Letters* 178, 282, 306
Process(es) and materials, in manufacturing, by E.P. De Garmo (book) 146
Process control, capacitance-type system 419
digital computer 576
hybrid computer application 665
Process industries, committee report 533
Process plant(s), flame proofing on 399
Process plant industry, tax system 76
Production Engineering Research Association, numerical-control programming systems 192
SI units conference 15. *Letter* 50
Production management, modern, by E. S. Buffa (book) 20
Production process, communication channels with process 446. *Correction* 661
Productivity, effect of fluidics on 398
in aircraft industry 457
Professional Engineers, United Kingdom Association of 204
Professional flexibility, BA activities 281
Profiling machine, Hawk 322
Program control 40
heat-treatment furnace 41
using magnetic tape 41
using punched tape 41
Programme-effects generator 519
Programmers 41
Project engineering, industrial 600
Project management, UMIST study 102
Projector, tungsten-halogen lamp 28
Promec stone-working machinery 168
Prompt payment plan 406
Propeller(s), variable-pitch, Stone Manganese 415
Propeller shaft bearings, inboard servicing 414
Protection mask laminator 65
Protector Safety Products (UK) Ltd., 'One Thousand Hour' lens 322
Proteus marine gas turbines, Rolls-Royce 335
Proving ground for vehicle testing 184
PTFE coatings for aluminium-alloy holloware 541
Public Buildings and Works, Ministry of, mains services trench 521
Public cleansing, by F. Flintoff and R. Millard (book) 528
Puch-Haflinger 700 AP patrol car 309
Pullin, James, H. and Co. Ltd., automatic vacuum/pressure impregnation plant 611
Pulse-code modulation in telephones 381
Pulse echo ultrasonics, Engineering Outline 555
Pulsed neutron techniques, Engineering Outline 301
Pump, boiler feed, Sulzer 38
concrete, mobile unit 471
hydraulic, for planing machine 347
liquid-metal 14
vacuum, water-jet 346
water, hand 263
Pumping engines, beam 51
Pumping station, micaceous residue 439
Punch and die-set tooling 65
Punched tape, programe control using 41
Pup aircraft. *See* Beagle
Pursell, C. W., readings in technology and American life (book) 44
Pye Electric Ltd., Tasc unit 43

Q

Quality, and reliability, by C. S. Smith (book) 300

motor-car 416. *Letter* 484
Quartz-controlled wrist watch 207
Quartz-halogen lamps 408
Quay Handling (Industrial Trailers) Ltd., cable drum handling trailer 419
Queen Mary liner, at marine recreation complex 268
colour print of 407
Quenching oils, accelerated, Energol 275
Quintinshill railway disaster, by J. A. B. Hamilton (book) 400

R

Rabone Chesterman Ltd., metric steel rules 216
Rackveyor chain conveyor 448-9
Radar and communications, mechanical engineering in, by C. J. Richards (book) 222
Radar waveguide pressurization system 419
Radiant light emission units 342
Radiation and isotopes in soil organic-matter studies (book) 324
Radiation shielding, by R. G. Jaeger *et al.* (book) 348
Radio link in remote control systems 477
Radio transmission, vhf, BBC 52
Radiography, neutron, AERE service 342
of meat cans 388
Radiometer, infra-red 137
Radiotelephone, Starphone, STC 78
Rae, A., work study (book) 198
Rail joint, glued 263
Rail tanker for liquid gases 459
Railway(s), International Union of 30
Middleton, preservation appeal 178
Netherlands, glued rail joint 263
North Western, of India (book) 172
underground, Hong Kong 104
electric haulage, by L. Szklarski *et al.* (book) 172
see also London Transport
vs roads, economics of 154
Zambian, railway traverser 217
Railway accident *See* Accident
Railway bridge *See* Bridge
Railway cargo securing by Load-Lok winch 191
Railway design since 1830, by B. Haresnape (book) 400
Railway locomotive. *See* Locomotive
Railway rolling stock, development plans 586
engineering problems 413
LMS coach 1923-1957, by R. J. Essery and D. Jenkinson (book) 604
Railway signalling, automatic 544
automatic warning system 127
by O. S. Nock (book) 146
development plans 586
Railway track, engineering problems 413
fixing methods 29
Railway track conductors for automatic signalling 544
Railway trains, Advanced Passenger Train project 248, 357
Railway traverser, Zambian Railways 217
Random processes, Engineering Outline 349
Rank film laboratories 156
Rank film studios, Pinewood 109
Rank Precision Industries, Varotal lenses 518
Rapin, M., L'hydrogene dans les metaux (book) 568
Rarden 30 high-velocity 30 mm gun 390
Rate processes, Engineering Outline 631
Rautaruukki Oy, galvanizing line 26
Raymond International, Hong Kong harbour tunnel 2
Reach truck, battery-powered 624
Reaction kinetics, elementary, by J. Latham (book) 630
Reader, K. S., British economy 203
Reading(s) in technology and American life, by C. W. Pursell (book) 44
Reading aids for paralysed persons 535
Reamaster paper cutting and collating machines 662
Rearsby Automotive Ltd., fascia parts 318
Recorders 41
see also under specific types of recorder
Redman B. & K. Engineering Ltd., levelling line 170
Redpath Dorman Long, Hong Kong harbour tunnel 2
Rees, William F. Ltd., thrust boring bridge process 553
Reeves, A., communications in 2020 434
pulse code modulation 381
Reeves, J. R., computer peripherals 579
Refinery, Invergordon 292
Refining, electro-slag, by W. E. Duckworth and G. Hoyle (book) 604
Refrigerated, gas-operated 88
Refrigerator, thermo-electric, for motor car 4
Refuse disposal, by incineration 293
domestic problems 180
see also Waste
Refuse treatment for metals recovery 52
Reiner, M., deformation strain and flow: an elementary introduction to rheology (book) 324
Reinforcement Manufacturers Association, slip paver 297
Relaxation, dielectric, Engineering Outline 325. *Correction* 330
Reliability, and quality, by C. S. Smith (book) 300
motor-car 416. *Letter* 484
Reliant Motor Co., conversions for disabled 207
Scimitar GTE motor car 381, 466
Reluctance motor. *See* Electric motor(s)
Remote control, techniques for 476
Remote indication and control techniques 476
Renault, Motor Show exhibits 418
Renault-10 motor car 284
Renault-12 motor car 339, 382
Renold Ltd., 1956-1967, by B. H. Tripp (book) 20
slat band chains 43
Rentokil Svenska, timber treatment 611
Resin, glass-fibre-reinforced, for tank repair 471
Revolution counter 144-5
RFD Ltd., Lineman's conducting suit 341
Rheology, an elementary introduction to, deformation strain and flow, by M. Reiner (book) 324
Engineering Outline 121
Richards, C. J., mechanical engineering in radar and communications (book) 222
Richardson, G. B., electrical plant price structure 509
Richardson, R. C. D., abrasive wear 479
Rimmer, G. M., gear wear 666
Ringway 2 motorway for south of Thames 78
Rite Machine Co., swarf recovery plant 572
River(s), hydraulic models, Engineering Outline 375
River control and drainage in New Zealand, by A. R. Acheson (book) 276
River pollution, china clay residues 438
new regulations 570
River Trent, pollution research 286
Road(s), expansion joints in, by W. Köster (book) 146
railways *vs*, economics of 154
see also Motorway
Road accident. *See* Accident
Road construction, concrete, slip paver 297
Kings Worthy link 180
materials research 4
Mersey Tunnel feeder system 167
programme 26
Road heating for snow and ice control 465
Road Research Laboratory, braking effect of gravel beds 355
motorcycle anti-locking brakes 28
road construction materials 4
tyre wear and road surface 308
Road surface, and tyre wear 308
conditions in ice and snow 465
Road transport, experimental route guidance 308
Roberts, Charles, Ltd., rail tanker 459
Roberts, F. B., Advanced Passenger Train project 248
Roberts, R. H., Middleton Railway 178
Robertson, J. M., fluidic components (book) 96
Robertson, M. F., communication 362
Robin-Nodwell, Juggernaut for tree cutting 89
Robins, T. L., craft apprentices 534, 610. *Letter* 584
Rock drilling equipment, Atlas Copco 168
Rock, P. A., chemical thermodynamics (book) 554
Rockbreaker for bridge demolition 318
Rocket engine, nuclear, XE 407
Rocket motor, nuclear, Nerva XE. *Letter* 27
Rockweld Ltd., comet boom 322
Rocol Ltd., lubrication of winch 445
Rodin, P., metal-cutting tools (book) 452
Rogers, D. G., electrical, magnetic and visual methods of testing materials (book) 504
Rogers, L., craft apprentices 584. *Letter* 610
Roll-a-Draw turn-over and stripping unit 573
Roll forming machines 65
Roll-on/roll-off vessel, *Atlantic Causeway* 239
Atlantic Conveyor 239
Roller bearing *See* Bearings
Rolling mill for sandwich strip 270
Rolls-Royce Ltd., Avon-powered gas turbine 14
Moduleplan machining centres 574, 597
Olympus 593 turbojet aircraft engines 284
Olympus TM3 gas turbines 415
Proteus marine gas turbines 335
RB 211 aircraft engine 108, 574 615
Silver Shadow motor car 418
Spey turbofan engine 212
Tyne RB209 gas turbines 415
Rolt, L. T. C. ,Waterloo Iron Works (book) 222
Romanoff, M., titanium corrosion in soil 661
Rondex Screen Processes Ltd., thick film microcircuits 445
Roof supports, test rig for 394
Root Harvesters Ltd., potato harvester 459
Rootes Group, Hillman GT motor car 364-5
Hillman Imp motor car 426, 653-4
Motor Show exhibits 418
Ryton factory reorganization 295
Sunbeam Alpine motor car 381
Rose, C. F., apprentice competition 282
Rose, Downs & Thompson Ltd., rolling mill 270
Rosenbaum, R., aircraft vibration and flutter (book) 504
Rosenberg, J. M., computer prophets (book) 478
Roskill Commission on airport sites 566
Ross Turnbull Ltd., stern bearings 414
Rotary engine, sliding-vane type 190
Tee. *Letters* 458, 560
Wankel 106, 189-90, 561, 654
Mercedes-Benz 180
Rotary motion, speed control 144
Rotax Ltd., European Machine Tool Exhibition 17
reluctance motors 627
Rotax Precision Products, ballscrews 171, 270
Rotherham and Sons Ltd., spraying machine 318
Rover Co. Ltd., Motor Show exhibits 417
Rowlinson, J. S., liquids and liquid mixtures (book) 96
Royal College of Art, wheelchairs 363
Royal Institution, Christmas lectures 535
Royal Mint, conveyor belting 165
Royal Shakespeare Theatre, lighting system 244
Rubber, silicone, Engineering Outline 199
Rubberfabriek Vredestein Loosduinen NV, collapsible dam 313
Rubery Owen & Co. Ltd., conveyor furnace 216
welding equipment 322
Russia, space programme 437, 535
Rust Engineering Co. Ltd., project engineering 600
Ryder, G. H., strength of materials (book) 528
Ryhope beam pumping engine 51

S

Saab, fluid forming 115
Safety, in trawlers 104
motor car, airbag 28
Safety belts. *See* Seat belts
Safety handbook, industrial, by W. Handley (book) 630
Safety measures, locomotive design 214
Safety precautions, explosives, by J. Calzia (book) 578
Safety regulations for motor cars 296
Saint *See* St
Saint-James, D., type II superconductivity (book) 348
Sales engineers, salesmanship for, by J. B. Windsor (book) 96
Salesmanship for sales engineers, by J. B. Windsor (book) 96
Salford University, adaptively-controlled drilling 522
Salter, George, & Co., Ltd., spring manufacture 548
Sand drains, prepackaged 597
Sand, P., *Which?* tests on corkscrews 659
Sanderson, B. T., titanium corrosion in soil 661
Sandwich panels, structural, by H. G. Allen (book) 324
Sandwick prepackaged sand drains 597
Sarma, G., type II superconductivity (book) 348
Satellite, aircraft communications 188
communications, air traffic control 540
earth stations, ballscrews 270
Goonhilly earth station 164
see also under named satellites

Saucepan, non-stick. *Letters* 584, 636
Saunders, G. A., pulse echo ultrasonics 555
semimetals 669
Saunders, W. L., translations 77
Saw blades, diamond, Diaborit 169
Sawers, D., sources of invention 668
Saxonia cargo ship 239
Sayers, M. H., apprentice competition 282
Scanlan, R. H., aircraft vibration and flutter (book) 504
Schenck dynamic-balancing machine 367
Schlenker, B. R., materials science (book) 426
Schleuniger Ratrac, space-linked track vehicle 89
Scholes, J., Transport Museum 125
Schools cooperation with industry 585
Science, engineering, at the university, by D. Hutchings (book) 478
Scientist, supply and demand relation 177
Scimitar motor car. *See* Reliant
Scorpion aluminium tank 264
Scotland, north-east coast development 292
Scott, A. A. H., aluminium strip 170
automatic gauging and inspection *Letter* 77
automatic sheet feeder 473
automatic slip paver 297
battery-powered vehicles 624
bonding silicon chips 19
concrete masonry 448
concrete mixing plant 503
container materials 319
control of events 40
control of speed 144
covered berth 396
diesel engine 527
digital-to-analogue converter 625
electroslag refining 39
fatigue testing of bearing steels 94
galvanizing 142
heating foil 421
inventions for licence manufacture 598
Marine aggregates 663
microwelding 524
parcel sorting 343
pneumatic handling 502
printed armature motor 196
reluctance motors 626
remote indication and control 476
Ryton factory reorganization 295
semiconductor production 368
silicone grease coating 91
small digital computers 576
springs for weighing machines 548
stage lighting 244
taper-tube flowmeter 141
tensioning device 344
ultrasonic tester 116. *Correction* 179
ultrasonic waves 372
Welding and Cutting Fair 321
Wickham Engineering demonstration 117
Scott, I., Steam Age 252
Scott Wilson Kirkpatrick and Partners, Hong Kong harbour tunnel 2
Scrap recovery from refuse 52
Screw, thread-forming, Square-Flow 216
Screw thread book (book) 146
Screwdriver, air-turbine-driven, Blowfeed 425
Sea, pollution of, comment on 609
Sea-bed mapping by sonar 561, 562
Sea-bed oil exploration 594
Seal(s), and sealing for dynamic conditions 498
balanced face 498
bushing 500
clearance-type 500
economics of 501
expanding-step ring 501
for reciprocating shafts 498
for rotating shafts 498
hydrodynamic-land 499
hydrostatic-land 499
labyrinth 500
lip 498
mechanical 498
by E. Mayer (book) 300
O-ring 500
rectangular 501
screw 500
screw pump 500
soft packing 498
split-ring 501
square-section 501
U-ring 500
unbalanced face 498
V-ring 500
visco 500
Seal testing facilities 165
Seaspeed, hovercraft passenger services 245
Seat belts, new developments 355
safety statistics 355
Security manual, by E. Oliver and J. Wilson (book) 426
Selection Trust Ltd., Mount Newman scheme 12, 13
Selective Employment Tax, Committee for Repeal of 432
Self Changing Gears Ltd., TN-15X gearbox 265
Sellotape Products Ltd., protection mask laminator 65
Selson Machine Tool Co., milling machine 216
press for fluid forming 115
Selsyn remote indication and control systems 477
Seltrust Iron Ore Ltd., Mount Newman scheme 13
Semco, pneumatic handling equipment 502
Semiconductors, junction diodes as oscillators 505
production of, Mullard 368
testing machine, Mullard 368
Semimetals, Engineering Outline 669
Sequence control and controllers 40, 41
Services, mains, common trench for 521
Sevcon plug-in program module 624
Severn and Thames canal, by H. Household (book) 70
Severn Tunnel, by T. A. Walker (book) 300
Sewage pipeline suspended from bridge 90
Sewage sludge incineration 360
Sewer and water-main design tables, by L. B. Escritt (book) 668
Sheet, steel, for cladding 342
magnetic handles for. *Letters* 51, 307
Sheet feeder, automatic, Geco 473
Sheet Metal Exhibition, International (London) 64
Sheffield Twist Drill & Steel Co. Ltd., trepanning tool 65
Shell(s), circular cylindrical, free vibrations of, by E. A. Armenàkas *et al.* (book) 276
Shell-Mex and BP Ltd., Energol quenching oils 275
Shell moulding of stator-case castings 419
Shell UK Ltd., Stanlow refinery lubricating oil plant 32
Shelvoke & Drury Ltd., cable drum handling trailer 419
Sherratt, A. F. C., air conditioning system design for buildings (book) 478
Ship, articulated, specification 127
by E. V. Lewis and R. O'Brien (book) 348
cargo, *Parthia* 239
Saxonia 239
coupling at sea 35
fluidics in 399
merchant, nuclear propulsion of 536
see also under specific type of ship
Ship information storage, Lloyd's Register 272
Shipbuilding berth, covered, Yarrow 396
Short, K. S., unit of mass 51. *Letters* 534, 610
Shower booth, mixing valve for 309
Shuttering, concrete, polystyrene blocks as 191
SI unit(s), conference, PERA (Brussels) 15. *Letter* 50
in engineering, by D. R. Blackman (book) 668
Letters 3, 51, 610
see also Kilogramme; Mass; Pressure; Time
SI unit demonstration rig 294
Sidebottom, O. M., elementary mechanics of deformable bodies (book) 20
Siemens AG, leak detection in gas pipes 522
Signalling, railway, automatic 544
automatic warning system 127
by O. S. Nock (book) 146
development plans 586
Silastofilm silicone rubber membrane 441
Silicon chips bonding 19
Silicon nitride for thermal shock. *Letters* 77, 126
Silicone grease coating of insulators 91
Silicone rubber, Engineering Outline 199
Silicone rubber membranes 441
Similarity and simulation with applications to problems in electrical power engineering, by V. A. Venikov (book) 478
Simon Engineering Dudley Ltd., concrete pump 471
Simon Handling Engineers Ltd., Simon-Boulger incinerator 293
Simons Lobnitz, suction dredgers 35
Simpson, C. R. H., adaptive control systems 474
assembly machines 420
automated assembly 218
ballscrews 171
bar automatic 143
billet inspection machine 323
Blowfeed screwdriver 425
Broom & Wade Ltd. 68
cam-grinding machine 602
cam-profile lathe 92
Cub Monobox cranes 369
diamond tool lathe 549
European Machine Tool Exhibition 17
gear-shaving machine 667
grinding machines 118
grinding wheel 472
heat-transfer media 628
locomotive design 214
machining centres 574
mobile cranes 450
numerical control 192
numerical control seminars 220
pattern flow moulding 573
pipe ends 599
planing machine 347
Power Transmission Exhibition 42
programmed painting 193
quenching oils 275
railway traverser 217
Reamaster machine 662
shaping stone 168
Sheet Metal Exhibition 64
thermic lance 603
tube forming 346
Viscount boiler 345
Simulation and similarity with applications to problems in electrical power engineering, by V. A. Venikov (book) 478
Simulation techniques, hybrid computer application 664
SITI, fast-firing electric kiln 241
Skefko Ball Bearing Co. Ltd., demagnetization of roller bearings 318
Skerrett, B., gas-fired air conditioning 88
Skin complaints by cutting oils 191
Skinner, S., differential 178. *Letter* 262
Skoda, market developments 11
motor car developments 11
Skynet defence communications system 311
Slat band chain, Coventry Mark 43
Slide rule, ten-figure, Hewlett-Packard 576
Slip-form paver for railway track 29
Slip paver for smaller roads 297
Smith, C. S., quality and reliability (book) 300
Smith, D. M., journal bearings in turbomachinery (book) 604
Smith, F. H., non-stick pans 636
pipe-smokers 283
see also On the Shelf articles
Smith, J. O., elementary mechanics of deformable bodies (book) 20
Smith, K. M., engineering principles for electrical technicians (book) 554
Smith, P. Higson, function cost analysis 529
Smith, S. F., telephony and telegraphy A. (book) 172
Smiths Delivery Vehicles Ltd., battery-driven vans 567
Smog formation from motor-car exhaust 127
Sneeden, J-B, applied heat (book) 374
Snow, road conditions in 465
Snyder, R. D., engineering mechanics of deformable bodies (book) 504
Social consequences of technology 261, 353
Societe Internationale de Telecommunications Aeronautiques, computer booking for airlines 381
Society for Terrain Vehicle Systems, conference (Essen) 89
Soder Wick de-soldering system 419
Soil(s), engineering, mechanics of, by P. L. Capper and W. F. Cassie (book) 120
Soil organic-matter studies, isotopes and radiation in (book) 324
Solartron Electronic Group Ltd., automatic dynamic analysis equipment 591
Soldered joints, de-soldering and cleaning system 419
Sol-gel processes for ceramic nuclear fuels (book) 70
Solids, interfaces in, Engineering Outline 427
Solus Schall non-destructive testing laboratory 388
Sonar, side-scan, for sea-bed mapping 561, 562
Sorting, letters, automatic 259
parcel, information theory in 343
Sound-effects generator 519
South Korea, power station 355

Southern Television, colour television 515
Southern Watch and Clock Supplies Ltd., de-soldering system 419
Sovereign motor car, Daimler 381
Soyuz spacecraft programme 437
Space environment, by N. H. Langton (book) 44
Space exploration, Grand Tour of outer planets 113
Space programme, applications, R. Jastrow 533
Russia 437, 535
Space research, British activities 210
Space station construction, welding techniques 437
Spacecraft, ground stations 311
visual observation simulator 78
Spark discharge erosion in gear wear 666
Spectrometer, infra-red 137
ultra-violet 137
Speed, linear, measurement and control 145
of vehicles, measurement of 145
Speed control, methods and devices 144
rotary motion 144
Tasc unit 43
Speed indicators 145
Speed measurement, optical methods 145
Speed recorders 145
Speed reducer, VSG Engineering 43
Speed selection aid for machining 394
Speedometers, magnetic drive 144
Spey turbofan aircraft engine 212
Spheroidal-graphite cast iron for boiler 345
Spray booths, paint, and ovens 613
Spray etching machine 64
Spraying, crop, ultra-low volume 86
Spraying machine, paint, automatic 318
Spring(s), building on, by R. A. Waller (book) 374
Spring manufacture, Salters 548
Spurr, R. T. automobile brakes and braking systems (book) 578
St Katharine Dock, redevelopment scheme 590
Stable superconducting cables, Engineering Outline 45
Staff-Bore thermic lance 603
Stage lighting, Royal Shakespeare Theatre 244
Stainless Steel Development Association 65
Stainless steel strip, polishing line for 90
Stainless steel tube forming processes 346
Staking, ultrasonic, equipment and technique 373
Stamps, postage, printing process 257
Standard Telephones and Cables Ltd., sea-bed sonar 563
Starphone radiotelephone 78
Standard-Triumph, sports car range 263
Standardization, for documentation, by B. Houghton (book) 70
international, J. La Que 2
Stanlow refinery, lubricating oil complex 32
Starphone radiotelephone, STC 78
Stator-case castings, shell moulding of 419
Staveley Machine Tools Ltd., Moduleplan machining centres 574, 597
Steam Age, model makers 252
Steam engine, history of, by J. D. Storer (book) 578
Steam generation, by J. N. Williams (book) 374
Steam tables, by J. H. Keenan *et al.* (book) 668
Steam valve chests 90
Steel, alloy, BS designations 90
bearing, fatigue tests on 94
stainless. *See* Stainless steel
Steel containers 319
Steel plant control problems, on-site analysis 623
Steel plate, lamination defects in 116. *Correction* 179
Steel rules, metric 216
Steel sheet, for cladding 342
magnetic handles for. *Letters* 51, 307
Steel Sheet Information and Development Association, steel sheet for cladding 342
Steering column, energy absorbing 361
Steering system, motor-vehicle, crack testing 389
Stein Atkinson Stordy Ltd., Aerol grinding mills and dryers 367
Sterngear, Glacier-Herbert system 42
Stevens, B., library services 636
Stewart, W. A., locomotive design 215
Stewarts and Lloyds, schools cooperation scheme 585
Stihl auger boring machine 165
Stil electric car 382
Stillerman, R., sources of invention 668
Stock control, computer application 576
Stockholders, materials, Metal Centres Ltd. 497
Stone Manganese, variable-pitch propellers 415
Stone-Vapor thermal fluid heater 628
Stone working methods and equipment 168
Stora Steel Ltd., bandsaw with magnetic chuck 270
Storage system for tools and fixtures 394
Storer, J. D., history of steam engine (book) 578
Stork-Werkspoor TM410 diesel engine 527
Strain, deformation, and flow: an elementary introduction to rheology, by M. Reiner (book) 324
Strain analysis, Moiré fringes in, by P. S. Theocaris (book) 172
Straker, E., Wealden iron (book) 20
Strand Electric & Engineering Co. Ltd., Royal Shakespeare Theatre 244
Strength of materials, by G. H. Ryder 528
Stress, materials under, by E. Gillam (book) 172
thermal, conference (Berkeley) 306
Strike of maintenance workers, LTE 559
Strip, aluminium, levelling line 170
stainless steel, polishing line for 90
Stroboscope and graduated disc 145
Stromag Ltd., clutches and brakes 42
Strongwork Diving (International) Ltd., deep-diving system 332
Structural engineering computer system, Genesys 2
Structural sandwich panels, by H. G. Allen (book) 324
Submarine Cables Ltd., sea-bed sonar 563
Submersible, *Ben Franklin* 31, 181
Pisces 6
Sud Aviation. *See* Concorde
Sulzer Bros (London) Ltd., boiler feed pump 38
Sumner, P., motor cars (up to 1930) (book) 198
Sun dynamometer and electronic engine tester 613
Sunbeam Alpine motor car 381
Superconducting cables, stable, Engineering Outline 45
Superconducting electric motor 597
Superconductivity, by D. Fishlock (book) 604
Type II, by D. Saint-James *et al.* (book) 348
Superheating in steam locomotives 542
Supermarkets, computer programs 181
Support ship *Vickers Venturer* 7
Surface finish, and friction (book) 198
diamond-tool turning 549
Surge, analysis of, by J. Pickford (book) 528
Surveying, plane and geodetic, by D. Clark (book) 630
Suspension, motor-car, dynamic test equipment 591
Swarf recovery plant 572
Sweaney, D., trade unions 126
Swiftplan's industrialized building system 115
Swiss, M., oil exploration on sea-bed 594
Switch, daylight-sensing 588
Synchro remote indication and control systems 477
Synthetic materials, for doors 407
for motor-car interior trim 407
Szklarski, L., underground electric haulage (book) 172

T

Tachograph for motor vehicles 486
Tachometer, condenser type 145
eddy current 144
electrical output 145
generator type 145
impulse type 145
magnetic drive 144
triggered electrical 145
Tafting, tube cold-forming process 346
Tafting machine, pipe and tube 346
Talysurf trace, for diamond-tool turning 551
Tank, Alvis Scorpion aluminium-armoured 264
fuel, collapsible 181
repair by glass-fibre-reinforced resin 471
Tanker(s), British Petroleum fleet 250
Manhatten, ice-breaker 314
nuclear propulsion of 536
rail. *See* Rail tanker
road. *See* Motor vehicle, tanker
Torrey Canyon, oil pollution 130
Tasc unit for torque and speed control 43
Tawse, William, Ltd., pipeline suspended from bridge 90
Tax relief proposals, civil engineering 76
Taylor, C. F., (Metal Workers) Ltd., cargo loader 385
Taylor, E. O. Penshaw, power system economics (book) 630
Taylor, J. W. R., Jane's all the world's aircraft (book) 554
Taylor Woodrow Construction Ltd., tensioning device for cylindrical concrete vessels 344
Taylor Woodrow Group, London dock redevelopment 590
Teaching. *See* Education
Technological forecasting, by R. V. Arnfield (book) 400
by G. Wills *et al.* (book) 324
Technology, and American life, readings in, by C. W. Pursell (book) 44
history of, bibliography of, by E. S. Ferguson (book) 198
Ministry of, reorganization 379, 431
social consequences of 261, 353
Techwork (Structures) Ltd. Heathfield television mast 617
Tee, R. G., rotary engines 560. *Letter* 560
Telecar baggage handling system 83
Telecine equipment, flying spot 517-8
Telegraphy and telephony, by S. F. Smith 172
Telemetry and command station, Oakhanger 311
Telemetry link for light buoy 588
Telephone, facsimile machine proposal 611. *Correction* 637
fibre optics 434
future trends, A. Reeves 434
pulse-code modulation in 381
Telephone cables, aluminium 185
Telephony and telegraphy, by S. F. Smith (book) 172
Television, closed-circuit, conveyor monitor 497
colour, aerial requirements 513
Anglia 515
ATV Network 514
cameras 518
correction equipment control 518
down-conversion to 405-line 512, 517
educational uses 518
electronic standards conversion 517
film processing for 156
Granada 515
ITN services 514
lenses 518
London Weekend 515
manufacturers role 516
new services 511-18
non-entertainment uses 518
picture quality 513. *Letter* 560
programme facilities 514
receiving equipment 513
review of advances and future developments 516
625-line standard 512, 517
Southern 515
telecine equipment 517-8
test card information 513
Thames 515
transmitter developments 516-7
transmitting equipment 512
Yorkshire 515
Television camera, Apollo-12 561
for Moon landing mission 59
Television equipment, Apollo 11 lunar mission 58
Television mast, Heathfield 617
Tenacity patrol boat, Vosper-Thorneycroft 334
Tensioning device for cylindrical concrete vessels 344
Tercol Ltd., Nitomin Z 522
Terrain vehicle systems conference (Essen) 89
Test rig for roof supports 394
Testing, non-destructive. *See* Non-destructive testing
of internal combustion engines, by A. B. Greene and G. G. Lucas (book) 504
see also under specific-types of testing
Testing machine. *See also* under specific type of testing machine
Testing materials, electrical, magnetic and visual methods of, by J. Blitz, *et al.* (book) 504
Thames Aeroport Group, Foulness scheme 566
Thames and Severn canal, by H. Household (book) 70
Thames Conservancy, flood precaution plans 486
Thames Estuary Development Co., Foulness scheme 566
Thames Television, colour television 515
Theatre, Royal Shakespeare, lighting system 244
Theocaris, P. S., Moiré fringes in strain analysis (book) 172
Thermair Domestic Appliances Ltd., foam plastic packaging 38

Thermal compression bonding, micro applications 524
Thermex heat-transfer medium 628
Thermic boring technique, BOC 603
Thermic lance, Staff-Bore 603
Thermobloc heater for football stand 535
Thermodynamics, applied, by T. D. Eastop and A. McConkey (book) 668
by J. Kestin (book) 44
chemical, by P. A. Rock (book) 554
Thermoplastics design data, Engineering Outline 173
Thick-film ferrites, APS technique 623
Thomas, E. J., type II superconductivity (book) 348
Thompson Cochran, boiler division 102
Thompson, John, Pipework and Ordnance Division Ltd., friction welding machine 322
Thorley, W. G. F., locomotive design 214
Thornley, R. H., group technology 446
Thorp, J. S, microwave Gunn effect oscillators 401
Thread, screw. *See* Screw thread
Thread-forming screw, Square-Flow 216
Thring, J. F., freight wagons 440
Thrust bearing, diaphragm-pad 598
Thrust-boring abutments in bridge building 552. *Correction* 597
Thurley, John, Ltd., gas burners 296
Thyne, William (Plastics) Ltd., foam plastic packaging 38
Thyratron control, stage light 244
Thyristors use in film studios 110
TI Stainless Tubes Ltd., tafting machine 346
Tilbury B power station 38
Tilghman Wheelabrator Ltd., clean air filters 76
Timber, pretreatment plant 611
Time, metrication proposal 15
SI units and 15. *Letters* 50, 126
Time domain measurements, Engineering Outline 605
Time machine, Christmas lectures 535
Tinson, R., central heating 636
Titanium, corrosion in soil 661
forming at elevated temperature 471
Tobacco drying process 644
Toner, R. K., conservation of mass energy (book) 120
Tonkin, S. W., colour television 560
Tool(s), diamond, turning with 549
metal-cutting, by P. Rodin (book) 452
selection aid 394
storage, Vidmar system 394
Tooling, preset, for bar automatic 143
punch and die-set 65
Torque control, Tasc unit 43
Torque converters, Voith Engineering Ltd. 42
Torrey Canyon, tanker, oil pollution 130
Torrington Co. Ltd., thread-forming screw 216
Torry Research Station, fish processing 207
Torsional vibration problems, by W. Ker Wilson (book) 20
Towler & Son Ltd., diving sphere 332
Toyoda Machine Works, cam-grinding machine 602
Tracking station, Goldstone 137
Traction engines, by B. J. Finch (book) 300
worth modelling, by W. J. Hughes (book) 504
Tractor, battery-powered robot 624
three-wheeled 89
ZKL Zetor 11
Tractortechnic Unitrac, rubber track shoe vehicle 89
Trade union, engineers' 126, 204, 354
one-only proposal 282
see also under names of specific unions
Trailer, articulated, for cable drum handling 419
Train. *See* Railway train
Training, CEI guidelines 509
industrial (BRIMEC) 281
see also Education, etc.
Training Act, Industrial, conference on 405
Training Board, Engineering Industry 281, 405
Training levy-grant scheme 635
Transformer, standardization economies 310
Translations and language barrier 77
Transmissions, and gears, by J. G. Giles (book) 120
automatic, in motor cars 443
see also Drive; Gear; Power transmission
Transport, air. *See* Air; Aircraft; Airlines; Airport
Ministry of, driving manual 561
railway. *See* Railway
road. *See* Motor car; Motor vehicle: Road
sea. *See* Ship
Transport Museum (Clapham and York) 125, 154. *Letters* 262, 306
Traverser for Zambian Railways 217
Trawlers, de-icing equipment for 104
safety measures 104
stern, *C. S. Forrester* 206
Tree cutting, Robin-Nodwell Juggernaut for 89
Trench for mains services 521
Trench, P., market planning 520
Trent, River, pollution research 286
Trepanning tool, Roto Bor 65
Tricycle, motor, design speculations 104
Trident 3B airliner 538
Tripp, B. H., Renold Limited 1956-1967 (book) 20
TriStar airliner. *See* Lockheed
Triumph motor car, model revisions 417
Triumph TR5PI motor car 654
Triumph TR6 motor car 84
Triumph Trident motorcycle 237
Truck, die-handler, battery-operated 624
platform, battery-electric 624
reach, battery-powered 624
see also Motor vehicle(s)
Truck conveyor system 165
Tube, stainless steel, forming processes 346
steel, Tru-Wel LF2 38
twin-tube micro-bore 191
welded, blast cleaning of 140
see also Pipe
Tube Headings Ltd., thrust boring bridge process 553. *Correction* 597
Tube making process, three-roll 497
Tube Products Ltd., Delta tube weld mill 367
Tru-Wel LF2 tubes 38
twin-tube configurations 191
Tube tafting machine 346
Tube weld mill, Delta 367
Tungsten carbide, use in rock drilling 168
Tungsten-halogen lamps, 28, 408
Tungsten-iodine lamps 408
Tunnel, Channel, prospects of 75. *Letter* 204
Hong Kong harbour 2
Mersey, Birkenhead approach scheme 82
feeder road system 167
Severn, by T. A. Walker (book) 300
Woodhead, cable installation in 470
Turbine, air, screwdriver driven by 425
steam, steam valve chests 90
Turbine generators (A. Frankel) 519
Turbomachinery, journal bearings in, by D. M. Smith (book) 604
Turner, H. D., inventiveness symposium 285
Turner, R., refuse disposal 180
Turning, flow, of metals, by J. A. Grainger (book) 120
with diamond tools 549
Twiflex Couplings Ltd., couplings 43
Tyne gas turbine. *See* Rolls-Royce
Typewriter, magnetic car, IBM Selectric 444
Tyre(s), Dunlop D75 cross-ply 386
Dunlop SP111 radial-ply 386
grinding mill and dryer support and drive 367
running-in 4
Tyre-protecting chain 309
Tyre wear and road surface 308

U

UK 3, 4 and 5 research satellites 210
Ulster, history of water power in, by H. D. Gribbon (book) 276
Ultrasonic holography, Engineering Outline 71
Ultrasonic insertion of metal parts in plastic matrix 373
Ultrasonic staking, equipment and technique 373
Ultrasonic testing machine for lamination defects 116. *Correction* 179
Ultrasonic waves, fixing and joining techniques 372
Ultrasonic welding, equipment and techniques 372
Ultrasonics, pulse echo, Engineering Outline 555
Ultrasonoscope Co. (London) Ltd., ultrasonic tester 116
Ultra-violet spectrometer 137
Underdeveloped countries, cost-benefit consciousness 162
see also Overseas
Underground electric haulage, by L. Saklarski *et al.* (book) 172
Underground railway. *See* London Transport
Unidentified flying objects, by G. I. R. Lore and H. H Deneaut (book) 426
Unione Costruttori Italiani Macchine Utensili, sheet handles. *Letter* 51
Unipower mid-engined motor car 105
Unisteel fatigue testing machine 94
Unit(s), SI. *See* SI units
United Kingdom Association of Professional Engineers 204
United Kingdom Atomic Energy Authority, BPWR reactor 537
United States, interest in metrication 2
see also American
United States Atomic Energy Commission, walnut abrasive for nuclear fuel elements 433
United States Highways Research Board, ERGS system 308
United States National Bureau of Standards, fingerprint coding 358
time-shared computer 522
titanium corrosion in soil 661
United Steel Cos. Ltd., fatigue tests on bearing steels 94
University(ies), computers in 2
engineering science at, by D. Hutchings (book) 478
see also under names of specific universities
Urwick Management Centre 76

V

Vacu-Blast Ltd., tube-end processing 140
Vacuum, high, production, cryogens in, Engineering Outline 223
Vacuum forming machine, Pinewood 109
Vacwell Ltd., bonding silicon chips 19
Valve, directional control, K & L 661
mixing, for shower booth 309
Valve chests, steam 90
Valve makers, Pegler-Hattersley Group 256
Van. *See* under Motor vehicle(s)
Vanguard aircraft, Merchantman conversion 468
Van Moppes, L. M., & Sons Ltd., diamond tools 551
Vaughan Associates Ltd., European Machine Tool Exhibition 17
Vauxhall Motors Ltd., model revisions 418
proving ground at Lidlington 184, 619
Viva motor car 653
VX4/90 motor car 364-5
VDF-Autoprogramer 18
Vectors, by J. Cunningham (book) 70
Venikov, V. A., theory of similarity and simulation (book) 478
Ventilation, film studios, Pinewood 110
Vereingte Drehbank-Fabriken, European Machine Tool Exhibition 18
Verge posts, plastic 154
Verti-Forma paper-making machine 384
Viaduct, Bidston Moss, for Mersey Tunnel 167
Vibration, and flutter, aircraft, by R. H. Scanlan and R. Rosenbaum (book) 504
free, of circular cylindrical shells, by E. A. Armenàkas, D. C. Gazis, and G. Herrmann (book) 276
Vibration problems, torsional, by W. Ker Wilson (book) 20
Vibrator unit for fatigue testing machine 66
Vibron air-operated bowl feeder 425
Vickers, A., Apollo II lunar mission 77
Vickers Ltd., nuclear-powered merchant vessels 536
Pisces submersible 6
Vickers Venturer support ship 7
Victor Products (Wallsend) Ltd., variable-speed drive 43
Victoria line (book) 528
economics of 154
Vidmar system of tool storage 394
Viscount oil-fired sectional boiler 345
Visual methods of testing materials, by J. Blitz, *et al.* (book) 504
Vitkovice Steel, forgings and castings 11
Viva motor car. *See* Vauxhall
Vogt, F., hydro-power plants (book) 198
Voith Engineering Ltd., torque converters 42
Volkswagen-181 motor car 383
Volkswagen servicing system 459
Volvo 1800S coupé motor car 382
Von Braun, W., President in space 331
Vosper-Thornycroft, *Tenacity* patrol boat 334
type 21 frigate 415
VSG Engineering Ltd., speed reducers 43

Vulkan experimental welding unit 437
V.V.B. Industrieanlagen, tube-end processing 140

W

Wagons, railway freight, high-speed 440
Walker, T. A., Severn Tunnel (book) 300
Waller, R. A., building on springs (book) 374
Walnut abrasive for nuclear fuel elements 433
Wandsworth Bridge, thrust boring construction process 552
Wankel rotary engine 106, 189-90, 561, 654
Mercedes-Benz 180
Wankum, A., office landscaping (book) 198
Wanson Co. Ltd., heated football stand 535
Ware, B. St M. F. Webb, electric cables 510
Warner Electric Ltd., brakes and clutches 43
Warner France SA, brakes and clutches 43
Warren Springs Laboratory, oil pollution prevention 131
Warskow, M. A., airport design 356
Washing machines, electronic 589
Wasp helicopter, Westland 614
Wassell, H. J. H., motor car reliability 484
Waste disposal and recovery problem 596
see also Effluent; Refuse
Watch, Ingenieur, International Watch Co. 638
Maiana, International Watch Co. 637
piezo-electric 207
Water-main and sewer design tables, by L. B. Escritt (book) 668
Water Pollution Research Laboratory 286
Water power in Ulster, history of, by H. D. Gribbon (book) 276
Water pump, hand 263
Water purification plant, potato products 620
Water supply, alkathene pipe for 165
River Trent research 286
Waterloo Iron Works, by L. T. C. Rolt (book) 222
Waterways, hydraulic models, Engineering Outline 375
Watkins, B. O., control systems (book) 554
Watney Mann, beer processing and storage 240
Watson, P., mid-engined car 153
Watt governor 144
Watt, James, and the separate condenser, by R. Law (book) 146
Watts, Charles, & Sons Ltd., horizontal press 216
Wavin Pipes UK Ltd., metric converter 497
Wayne Kerr Co. Ltd., printed circuit board testing 522
Wealden iron, by E. Straker (book) 20
Wear, abrasive, Engineering Outline 479
gear, by spark discharge erosion 666
in printing machines 395. *Letters* 432
Wearne, S. H., project management 102
Weather Watch, World 263
Webb, J. D., random processes 349
Weerspertrekvaart waterway, flood protection 313
Weighing machine, by T. J. Metcalfe (book) 120
springs for, Salters 548
Welbourn, D. B., gear wear 395, 666. *Letter* 432
Weld mill, Delta tube 367
Welding, cold-pressure, micro applications 526
developments review 321
electron-beam, micro applications 526
friction, micro applications 525
in space station construction 437
micro applications and methods 524
plasma arc, micro applications 526
resistance, micro applications 524
thermal compression, micro applications 524
ultrasonic, equipment and techniques 372
micro applications 525
Welding and Cutting Fair (Essen) 321
Welding boom, Comet 322
Welding handbook (book) 324
Welding helmets, lenses 322
Welding Institute, Welding Fair (Essen) 321
Welding machines, Arcmaker Sprite 321
exhibits (Essen) 321
friction, John Thompson 322
Welding unit, Vulkan experimental 437
Weldless Steel Tube Co. Ltd., three-roll tube making process 497
Wellman Bibby Co. Ltd., couplings 43
Wellman Gas Engineering Ltd., natural-gas conversion 191
Wellman Incandescent Furnace Co., electroslag refining 39
Welty, J. R., fundamentals of momentum, heat and mass transfer (book) 630
Wenglarz, R. A., dynamic analysis 194
Wen-Plast Ltd., doors of synthetic materials 407
Wessex Industries, battery-powered trucks 624
robot tractor 624
Western Offshore Drilling & Exploration Co. 594
Westinghouse Astronautical Laboratory, Nerva XE nuclear rocket motor. *Letter* 27
Westinghouse Brake & Signal Co. Ltd., locomotive brake layout 215
painting plant 394
Westinghouse Electric Corp., Apollo 12 television camera 561
induction heating laboratory 140
Westland Wasp helicopter 614
Westool Ltd., brakes and clutches 43
Wharves, reinforced concrete, in Norwegian waters, by O. E. Gjorv (book) 324
Wheel, bicycle, assembly machine 219
motor-car, design trends 158. *Letter* 406
Wheelchairs, design of, RCA study 363
Which?, motor-car testing 266
tests on corkscrews 659
Whitby, R. H., STOL operations 356
Whitwell, J. C., conservation of mass energy (book) 120
Wickham Engineering Ltd., Cosmopolitan hoist 117
Moon conveyor 117
Wickman Machine Tool Sales Ltd., bar automatic 143
electro-erosion conference 63
European Machine Tool Exhibition 18
Wickman Scrivener cam-profile lathe 92
Wicks, C. E., fundamentals of momentum, heat and mass transfer (book) 630
Wiggins Teape Research & Development Ltd., Reamaster paper cutting and collating machines 662
Wilkins, F. E., escalators 584
Williams, E. G., inventiveness symposium 285
Williams, J. N., steam generation (book) 374
Willmott, F. B., mutterings of dissenters 153
one union 282
second career 307
Wills, G., technological forecasting and corporate strategy (book) 324
Wilson, C., gear wear 432
Wilson, J., security manual (book) 426
Wilson, M., acoustoelectric effects 97
energy (book) 348
Wilson, R. E., fundamental of momentum, heat and mass transfer (book) 630
Wilson, W. Ker, torsional vibration problems (book) 20
Winch, Load-Lok, railway cargo securing by 191
lubrication of 445
Winchester, Kings Worthy link road 180
Windsor, J. B., salesmanship for sales engineers (book) 96
Winkler, J., marketing for developing company (book) 222
Winnan, H. W., silicone rubber 199
Wiser Engineer, central heating 485, 610. *Letter* 534
Wolf Sapphire 70 drill 291
Wolseley-1885 motor car 443
Wolseley 18/85 Mark 2 motor car 285, 364
Women engineers in Norway 380. *Letter* 432
Wonderful world of engineering, by D. Jackson (book) 668
Wood, A. A., fatigue testing machine 66
Wood, A. M. M., coastal hydraulics (book) 426
Woodhead tunnel cable installation 470
Woodworking machine, Emco Star 290
Work study, by A. Rae (book) 198
Workshop technology, by H. Wright Baker (book) 44
World Bank, population planning 329
tourism 329
World steam in the 20th century, by E. S. Cox (book) 96
World Weather Watch 263
Wright, G. F., gas-fired air conditioning 88
Wright, R., process industries committee 533
Wrist watch. *See* Watch
Writers, enginers as 25. *Letters* 76, 153
Writing aids for paralysed persons 535

X

X-ray examination of meat cans 388

Y

Yak motor car. *See* GP
Yarrow (Shipbuilders) Ltd., covered berth 396
type 21 frigate 415
Yorkshire Television, colour television 515
Young, R. H., central heating 636

Z

Zambia, copper industry 185
Zambian Railways, railway traverser 217
Zeiss pocket binocular 645
Zemanian, A. H., generalized integral transformations (book) 70
ZKL Zetor tractors 11

Printed by Harrison & Sons Ltd, by Appointment to HM The Queen, Printers, London, England
Published by ENGINEERING LTD, 36 Bedford St, London, WC2